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Episode 13: Not Your Father's Ride

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Much has changed since the first advanced driver assistance systems were introduced and today's "rides" bear little resemblance to those of the past. Matt Moore, senior vice president at the Highway Loss Data Institute, joins the show to explain how the complexity and construction of modern vehicles affect claims frequency and severity. He also shares current trends in consumer driving behavior that have led to an increase in accidents and fatalities.

Ryan Mandell: Welcome back to the Mitchell Collision Podcast. I'm your host, Ryan Mandell, and we have a really special episode for you today. I'm super excited to be here in Marco Island, Florida at our Envision Conference 2024. And I'm joined by Matt Moore, who is senior vice president at the Highway Loss Data Institute (HLDI). Matt did a fantastic presentation in our general session yesterday and was gracious enough to spend some time with us today talking about some of the changes in vehicle complexity and some of the changes in the car parc that are really impactful for insurance organizations and for the collision repair industry. So, Matt, thank you so much for your time today.

Matt Moore: Ryan, thanks a lot for having me.

Ryan Mandell: So you work for the Highway Loss Data Institute, and that is very closely associated with the Insurance Institute for Highway Safety. So for the folks that are listening that maybe aren't as familiar with those organizations, maybe just give us a little bit of background about what those entities do and what your role is.

Matt Moore: So to some extent, the story begins with the baby boomers. So as the baby boomers began to drive, as my old boss who was a baby boomer, Kim Hazelbaker, used to say: we weren't very good at it. Baby boomers are not good at driving. So it was this national concern about highway safety and some very forward-thinking insurance executives said we need to band together and do something about this problem. This was even before the precursor to what we would now call NHTSA, the National Highway Traffic Safety Administration, before NHTSA was formed.

They stood up the Insurance Institute for Highway Safety in 1959 and then recruited sort of, a pioneer in the world of highway safety. He was an emergency room physician: Doctor Bill Haddon. Haddon set us on the course that we're on today and was having a lot of success. Then in 1972ish, the executives said, well, we all have a whole bunch of data. Why don't we give it to the IIHS and let the IIHS do highway safety research using insurance data? And so they did that, and they saw it was a deep, rich data set from which the Institute could draw insights, and it was also a way for them to share data.

So HLDI was separately incorporated and stood up as a separate entity. And we have functioned sort of as two sides of the same coin ever since. And if you think about the name the Highway Loss Data Institute today, everyone talks about data all the time. And there's so many companies and organizations with the word data in their name or their mission. If you think back to 1972, how few people were doing data. I think it just shows the forward thinking of the insurance industry and their commitment to safety.

Ryan Mandell: And so when you're looking at all these different studies, it's based on insurance data that's coming from a wide swath of the industry. I mean, I think you were saying that you were receiving data from roughly 85% of property and casualty insurers in North America. Is that right?

Matt Moore: That's correct. So our membership represents about—if you're counting on a premium basis or the broad membership provides us with financial support—represents 92% of private passenger auto in the U.S. And then the subset of those companies that provide us with their loss data, as you correctly said, 85% of private passenger auto.

Ryan Mandell: So when you're looking at all that data, you know, I think one of the things that is most evident when you're driving around today is the types of cars people are in look a lot different than they did 10 years ago or even five years ago. People are choosing different vehicles today. So what does that look like in your data? How are you seeing that play out in terms of the choices that people are making, consumer preference around these different vehicles?

Matt Moore: Yeah, there are far more SUVs in the U.S. vehicle fleet than ever before. And to a large extent, those SUVs have replaced cars. And so that's big takeaway number one. Pickup trucks on a market share basis, looking at new model year vehicles, kind of have held steady over the years. But the interesting thing going on there is I always say this during my presentations, when I started driving in 1986, my dad had a Chevy pickup. It had two doors, one bench seat and two-wheel drive. And these days, almost every new pickup is some version of four big doors and four-wheel drive, and with all the amenities that many luxury vehicles have. Whereas, you know, back in ‘86, pickup trucks tended to be very stripped down, economical vehicles.

Ryan Mandell: Pretty utilitarian.

Matt Moore: Very utilitarian.

Ryan Mandell: Looking at pickup trucks, you almost can't find an extra cab. Everything has those four full-sized doors. And so that has to make an impact, no pun intended, when that vehicle is in an accident because the dynamics of the accident has changed because of the way that the vehicles have changed.

Matt Moore: Everything I just said factors into the increasing weight and weight, I won't say it's everything, but it's a big piece of the equation in terms of how much force is generated in a crash. It's weight and it's vehicle speed. And the transition from car to SUV is a transition which has made the U.S. vehicle fleet heavier. The increasing percentage of vehicles that are all-wheel drive is also a contributor. That could be anywhere from 150 to 700 pounds of additional weight, depending. Now it's hard to pin down exactly how much weight is associated with the drivetrain as often those are up-trim vehicles as well. But all of these things can, you know, four-door caps—all of these things are contributing to additional vehicle weight.

Ryan Mandell: And I heard you say the all-wheel drive piece yesterday and I hadn't really thought about that before. Why is it that manufacturers are moving to more all-wheel drive? Because I remember, you know, 15 years ago, the all-wheel drive was a very premium option and now it just seems every vehicle has it.

Matt Moore: I don't have a good answer for that. What I do know is that three of the four vehicles in my personal vehicle fleet are all-wheel drive. I have a Subaru Outback, and you can't get those without all-wheel drive. My daughter drives a Forester, which used to belong to my father, which those are all-wheel drive. And then, my wife wanted the new Toyota Sienna. And the one we chose just happened to be all-wheel drive.

Ryan Mandell: I think that additional weight, I mean, all those extra components, they're going to play into that. And, as you mentioned, that impacts the final equation in the collision so to speak. You know, I think a great point you brought up yesterday was just: its math. When it comes down to it, you know, there's a greater force being applied when you have a heavier vehicle. But you also were saying that there's more power in these vehicles today.

Matt Moore: A lot more power. It's a great discussion about how or why we got to where we are. But when I started in HLDI in 1999, there were just a few handfuls of vehicles that made 500 or more horsepower. And now today, 500 horsepower is almost blasé. Especially when talking about electric vehicles, 750 is not uncommon. And there's at least two handfuls of vehicles that make over 1,000 horsepower now, whereas, I think to the best of my recollection, the Bugatti Veyron had been the first vehicle that I remember that cleared the 1,000 mark. And that was a prohibitively expensive vehicle. Not a big concern from a highway safety perspective. But now we're seeing vehicles that are sub-$100,000 where they're approaching 1,000 horsepower.

Ryan Mandell: So what does this all mean when it comes to the kind of statistics that you see from highway deaths and highway injuries? I think injuries or deaths were going down for some time. I think that has kind of reversed course a little bit. Is that right?

Matt Moore: It has reversed course. It has reversed course a lot. And it's interesting if you look at fatal crashes, tragically, there's just bad activity or bad choices, and a huge overlap between speeding and driving under the influence of alcohol and not wearing seatbelts. And, if we could just wrestle those three things to the ground. I think most of us or I hope that most of us agree that driving under the influence is a really bad choice.

Ryan Mandell: Yes.

Matt Moore: And what's wild is if you look at the general population, seatbelt use is very, very high. So I think most of us agree we should all wear seatbelts.

By contrast, we all have a strange relationship with speed. And I think dispassionately sitting around a table, we at least can all agree that everybody else should obey the speed limit.

Ryan Mandell: Yes.

Matt Moore: But when we're behind the wheel, it is tough. And, vehicles go so, you know, sometimes I struggle with my Outback just to keep it at 25 when I'm on a surface road. That vehicle is smooth. And that's another thing about vehicles today, especially the electric vehicles. Manufacturers have done a phenomenal job of eliminating the cues to tell us we're going fast. You know, the noise, the harshness, the vibration. I can remember in the early '90s driving from the college that I attended to my parents place and being on Interstate 80. I had this old beater Subaru—I think it was an '82 or an '83—and I could barely get that thing to go 55, and it felt like it was going to shake the fillings loose in my teeth. So I just really couldn't speed in that. My wife's new Toyota Sienna, it is just as smooth as glass and no noise, no vibration and nothing to tell you. And it's a hybrid now. And that's another thing we might delve into is the extent to which hybrids are really exploding and I don't mean combusting.

Ryan Mandell: Right. The rate of adoption.

Matt Moore: The rate of adoption.

Ryan Mandell: Exactly.

Matt Moore: You know, at idle, it's shut down. And so there's nothing. And then off the line, it moves.

Ryan Mandell: I drove my first electric vehicles this year. I drove a Kia Niro and I drove a Mustang Mach-E. I couldn't believe the kind of power. And, I mean, like you said, it's so smooth. All of a sudden, you look down and you're going a hundred miles an hour, and you don't even realize it.

Matt Moore: It's not hard.

Ryan Mandell: No. Do you all get any information around distracted driving? Are there indications of that in any of that data that you can compile and marry against some of these other variables.

Matt Moore: If you look at the numbers that NHTSA puts out, it's hard to believe they're true. And it's a difficult problem to understand. And I think we can all agree that everybody shouldn't be driving distracted. And we all see people driving distracted on a regular basis. But there really isn't much great data. CMT is doing some really good things to understand the scope of the problem. And, you know, the IIHS has done some studies that indicate in some states that have recently passed very severe, like don't touch laws, those appear to be making a difference. But it's a difficult problem to study. And one of the things that happened during the pandemic is we saw a significant decline in routine traffic, and there was a whole confluence of factors that led to that. So, as a consequence, there has just been a big rise in all sorts of bad driving behaviors.

Ryan Mandell: Absolutely.

Matt Moore: And distraction is likely among them.

Ryan Mandell: Sure. And it's interesting, when I think of the increase in vehicle weight, kind of getting back to that portion a little bit. One of the things that we look at all the time in our data is the different types of materials that manufacturers are using to construct these vehicles. And from a collision repair standpoint, most of them aren't very easy to repair in terms of if you actually want to keep the same panel and fix the damage to it. It seems like there's a continual move towards lighter weight materials to help offset some of these things that we're talking about here. The all-wheel drive, the different technology that's incorporated, all these different features that add weight to the vehicle, especially high-voltage batteries in either a hybrid or a full EV setting. So is that something when IIHS is conducting these crash tests, is there a focus on the kind of materials and how they perform in those different settings?

Matt Moore: The core of our testing—what we refer to as our production testing—is a crashworthiness evaluation. So looking at how well vehicles protect occupants when crashes occur. And then we also have a testing program that evaluates vehicle headlights and also evaluates front automatic emergency braking systems and how well they can detect vehicles and pedestrians. Occasionally, we do studies looking at damageability. For example, when Ford released the aluminum-intensive F-150, we did some testing on that to compare it to other vehicles.

Ryan Mandell: I remember, I think you did some studies to look at the steel bedside versus the aluminum bedside.

Matt Moore: In addition to that, at HLDI we published at least two, if not three studies, on the aluminum intensive F-150. And my memory is failing me exactly what generation it was, but the generation of the BMW 5 Series.

Ryan Mandell: I think you mentioned something there that I kind of forgot about, but we talk about all the time in our settings is the shift in headlight technology and the move towards these just insanely expensive LED headlights to where you can't, I mean, most vehicles don't even have a halogen option.

Matt Moore: I would like for us to stop talking about headlights. I don't know what the term should be, but the term headlight should be reserved for the sources of illumination that assist drivers with the nighttime driving task. Those are vital, important safety technologies, period. By contrast, many vehicles now have all sorts of accent lights, and the driver in me and the person in me that loves technology and loves design of all forms, I love the esthetics of all these accent lights that the vehicles have. I think they're just super cool looking. By contrast, though, the contribution to severity—an increasing number of vehicles have all sorts of accent lights all over the front of the vehicle and lighted logos. Again, as a driver, I think they look really cool. But from a repair perspective, these things are prohibitively expensive.

Ryan Mandell: That's on top of all the other things that are going into the cost of repair increases. Not to mention, I mean, just the technology these kind of vehicles are being equipped for today. And, oftentimes, when we're looking at some of our data, we see that the electrified vehicles are oftentimes at the cutting-edge of some of these technological advancements. And I know you talk a lot about some of these features that vehicles have today that you just think about not only what the feature does, but then when that vehicle is in an accident, now you have to bring that back to pre-loss condition. And that's a lot more complicated with some of these features, right?

Matt Moore: Yes. These bits of technology, the sensors that enable these functionalities—collision avoidance functionalities which are life-saving technologies proven to have benefit, crash-reducing benefits, life-saving benefits. But the sensors that enable those functionalities are not cheap and they are not simple to replace and install. And as we've been talking a lot about over the course of the last two days, they also need to be recalibrated. And those procedures can vary considerably from one manufacturer to another and even from vehicle to vehicle. And there's time and overhead associated with training and tracking, tracking that information and training technicians to do those re-calibrations. And they add to the cost of the repair.

Ryan Mandell: And I think one of the big questions that we always have, and you kind of brought it up with these crash avoidance technologies, is I think the insurance industry is willing to bite the bullet on the severity increase if there's a frequency decline. That's always kind of been the promise. And I think, you know, some of your data shows that there is a significant decline when those capabilities are enabled on a vehicle. Do you have a sense of when we start to really see a tipping point in the industry, where crash volumes really start to go down as a result of this technology?

Matt Moore: So, for example, one of the studies I shared yesterday was a look at what we referred to as ADAS bundles. And one the most common bundles is the bundle of forward collision warning, front automatic emergency braking and lane departure warning. And we're seeing about a 10% reduction in collision frequency associated with that technology. But our best guess is front AEB is only on about 27% of vehicles in the fleet. So on vehicles that have the tech, we're getting a 10% reduction. And if I was getting a 10% return on my savings account, I'd be thrilled.

Ryan Mandell: Right!

Matt Moore: It's a good number. But across the fleet, you're looking at 27% of a 10% reduction, which is not a big reduction. And it's going to take a long time for the fleet to turn over. And the interesting thing is, as more vehicles have more ADAS, the turnover of the fleet is going to take longer. We're going to total out fewer vehicles because fewer vehicles are getting into crashes. And then just vehicles are far more reliable and durable than they've ever been.

Ryan Mandell: And I think one of the other things that delayed kind of the, the benefit of ADAS is just the way the vehicle values changed in the last few years. I mean, you now have a $10,000 vehicle that was worth $15,000. And so now that vehicle is getting fixed as opposed to getting totaled. And so that delays some of those end-of-life moments for those vehicles.

Matt Moore: COVID changed a lot of things.

Ryan Mandell: That’s an understatement.

Matt Moore: Yes, and including to some extent, our ability to study and understand and track some of the critical safety measures.

Ryan Mandell: And so when you think about just all of this change that has taken place, I know you mentioned a couple of things about the way that your organization is doing things differently today because of these vehicles. So maybe we can close out just talking about, how does IIHS and HLDI evolve to meet the needs of these vehicles and be proactive so that we have a better understanding of all the different dynamics surrounding modern vehicle crashes?

Matt Moore: So it's hard wired into our DNA. And just to provide you with an example. So we launched our first crash test in the early ‘90s. And that was what we referred to as a moderate overlap frontal crash. So 40% of the tested vehicle overlaps the crash barrier, hits the barrier at 40 mph. We are constantly looking at real-world outcomes to determine whether or not these changes that we have encouraged manufacturers to make are conferring real-world benefits.

Timing. About 10 years ago or so, we became aware that, basically, if you reduce the amount of overlap in the crash, you could get a significantly different outcome. So for a vehicle that aced a test with 40% overlap, if the crash happened outside of the frame rates, so that original scenario I described as two vehicles on a two lane road. One driver is doing what they're supposed to do. The other is not. They're distracted. They're eating a cheeseburger. They wander across the center line and the vehicle is hit. Take that same scenario but have that scenario B where one of the drivers takes evasive action and then hits, a bridge abutment or tree or a pole and that happens outside of frame rails. What we found was that you could have a good-rated vehicle, and it could fail in that crash. And so then we began testing that. And in the early 2000s, we knew that another big peril in terms of fatal crashes that wasn't being addressed by a frontal test was side impact. And so we launched a side impact test that was different from the federal government's. We were using the front end effectively of a Ford Explorer, a Ford F-150. And we were testing at a higher speed.

Over time, as we were monitoring those changes, we realized that we just weren't seeing the rate of improvement that we had been earlier on when we first launched the test. So we realized that the vehicle fleet had moved on, it had gotten heavy and that crashes were happening at higher speeds than we were testing for. And the front ends of vehicles were crushing differently than they had been crushing when we had first launched the test.

So we also changed the crush characteristics of the barrier. So we increased the barrier speed. And when I say barrier and side test, the tested vehicle is stationary. And we strike the tested vehicle with what we call the MDB, the movable deformable barrier. And so we significantly increase the weight of the MDB, increase the test speed and started getting very different results.

So what I'm conveying is just we're in this constant cycle of looking for a problem, looking for solutions to the problem, and then attempting to expand the presence of that solution in the vehicle fleet. And that's something we just do on an ongoing basis. We've done that with crashworthiness. We're doing it right now with collision avoidance technologies. When collision avoidance systems first came to market, there were significant benefits just for warning. And so our ratings program for front-crash prevention systems gave credit for systems that simply warned. And then we launched the first tests of those systems, and we were testing at 12 and 24 mph, which are relatively benign hits. They're expensive, but they aren't necessarily injury-producing crashes, but they're the core of insurance claims or at least collision and property damage liability claims. And now that almost every new vehicle has those technologies, we're increasing the test speed. And a few years ago, we started testing for pedestrians. We also started testing at nighttime. So we're just in this constant cycle of evaluating, looking for remaining problems, looking for emerging problems, and just figuring out who's got this problem solved and then trying to push all manufacturers to best-in-class performance.

Ryan Mandell: And do you think there will be a time when you have to create different scenarios? Later on down the road when we do have more electric vehicles on the road, I imagine the mass distribution is different. So the front-end of an electric vehicle without an engine in it, it’s center of mass is somewhere else because of the high-voltage battery. So does that create a need for a different kind of maybe MDB in order to simulate how a vehicle responds when it’s involved with an ICE vehicle or with an EV?

Matt Moore: I'm not sure we have enough time for that. So the answer to your question is “yes” and “no”. And when I say that what I mean is that vehicle compatibility has always been a big issue. When vehicles first downsized in response to the oil crisis, crash compatibility was a huge problem. We had vehicles like the Pinto and the Gremlin, you know, tangling with massive sort of old 1960s and early 1970s big honkin’ sedans. And it was an issue then. Then when Smart Fortwo was brought to the U.S. market and Honda introduced the Fit and Toyota brought the Yaris, we were very concerned again. And now with the electric vehicles, when Tesla first brought the Roadster, it was heavier than other vehicles that occupy the same footprint. But it wasn't an outlier. Now we're seeing vehicles with weights that are significant outliers. And it's a huge cause for concern. And so the differences in weight, they’re not a new issue. Differences in ride height, not a new issue. But the extreme weight and power and performance of vehicles in the private passenger market, that’s a new thing.

Ryan Mandell: Absolutely. Well, I think it's all going to continue to evolve over time here, especially as we see more of these different types of powertrains on the road. But, Matt, I just want to say thank you so much for being so gracious with your time. It has been fantastic to spend some time with you the last few days here in Marco Island, and we can't wait to see the kind of research that your organization is putting out over the next several years.

Matt Moore: Awesome. Thanks for your time, Ryan.

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