



U.S. Department of Transportation
Federal Motor Carrier Safety Administration

OFFICE OF ANALYSIS, RESEARCH, AND TECHNOLOGY

Why Trucks Collide with Cars

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Webinar Transcript

Presenters

- Dr. Ralph Craft, Senior Transportation Specialist, FMCSA Office of Analysis, Research, and Technology (ART)

Speakers (optional)

- Kirse Kelly, Web Conference Host, FMCSA ART

Description:

Half the crashes in the Large Truck Crash Causation Study involve a single truck and a single passenger vehicle (car, pickup truck, van, SUV). The Webinar will focus on the reasons for these crashes and the factors that increased the risk of the crashes.

PRESENTATION— WHY TRUCKS COLLIDE WITH CARS

PRESENTATION TITLE SLIDE: WHY TRUCKS COLLIDE WITH CARS

Carol (Operator):

Welcome and standing by. At this time, all participants will be in a listen-only mode until the question and answer session for today's conference. To ask a question, you will press *1 on your touch-tone phone. This conference is being recorded. If you have any objections, you may disconnect at this time. I'd now like to turn the call over to the FMCSA web conference coordinator, Kirse Kelly. Thank you ma'am, you may begin.

Kirse Kelly (Web Conference Host, FMCSA ART):

Thanks Carol. Thank you to everyone who is participating in this webinar today. We'd just like to welcome you. The webinar is on Why Trucks Collide with Cars, and it's a part of the series put on by the FMCSA's Office of Analysis, Research and Technology. You will be able to submit questions in a box on the left-hand side of your screen. That's a **Q&A Box**. As Carol mentioned, all questions will be answered at the end of the call. You can submit questions both online and ask them over the phone line at that time. You can also ask questions throughout; in terms of—you can just type them in and once again, we'll answer them at the end of the conference. Please note that you're going to be given the opportunity to receive a copy of the presentation; to download the presentation at the end of the webinar. We get that question a lot—but just to let you know in advance. So let me go ahead and turn you over to Dr. Ralph Craft.

Dr. Ralph Craft (Senior Transportation Specialist, FMCSA ART):

Hello out there in Internet Land. In 1998, Terry Shelton, who was then the new Chief of the Analysis Division—she beat me out for the job—called me into her office and asked me what I thought the Division should do. I said that since there were no databases that focus on the causes of crashes, we should do a crash causation study. Terry said that was a good idea and assigned me to head it up.

The legislation that took effect in 2000—we were mandated and generously funded by Congress to do such a study. With NHTSA field teams, we collected data on over 1,000 large truck crashes in 33 months in 2001 through 2003. It took two and a half years to process all the data, get a report to Congress in May 2006, and put the database up on our Website which was available to the public in July 2006.

Many of you are aware of the study and some of you have probably heard me talk about it previously.

Today we're going to focus on what really concerns you—getting creamed by a huge semi. Maybe even that big truck was carrying hazardous materials which, when it blows up, will turn you into cosmic dust in a nanosecond.

Sixty percent of all large truck fatal crashes involve a collision between a single passenger vehicle and a single large truck. Now, one note about the data that I am going to present. We drew a representative sample of large truck fatal and injury crashes, which allows us to project what happens in all such crashes.

Take it from somebody who has been looking at crash data for about 15 years, there's not much change from year-to-year. What happened in 2001 through 2003 is pretty much what's happening today. For example, the figure of 60 percent of all large-truck crashes are a crash between a large truck and a single-passenger vehicle is true today, as it was in the early part of the 21st century.

SLIDE 2: DEFINITIONS

First we need to talk about a few definitions.

What do we mean by “cause”? We define “cause” as factors that increase the risk of a crash, such as driving behavior, vehicle problems, road or weather conditions. Now, I'll confess to you that I have made some driving mistakes in my time. I have driven with a little too much alcohol in me and never had a crash. I have driven in a fatigued state at times and not had a crash. I have driven too fast for conditions or speeding, and not had a crash. Yet I think we can—and probably a lot of you or all of you have committed one of these three sins. We're talking about sins today because the Pope is here in town in D.C.

I think we would all agree that alcohol consumption, being fatigued and driving too fast for conditions cause crashes, but they don't always cause crashes. In fact, they rarely cause crashes. What they do is that they increase the risk of having a crash. We hypothesized that many factors increase the risk of having a crash and so we collected data on over a 1,000 associated factors in our study. We want to find the big ones. We want to find factors that FMCSA can do something about through regulation or outreach or education, or that other Federal agencies or the private sector can do something about.

Second definition—“trucks.” We mean large trucks—trucks with a gross vehicle weight rating of more than 10,000 pounds. That's everything from local delivery trucks like UPS or FedEx up to tractors pulling two trailers. Sixty-two percent of the trucks involved in our study were tractors pulling a single semi-trailer—the ubiquitous 18-wheelers that we all worry about. Eleven percent was other combination truck configurations, and 14 percent were single-unit vehicles with three or more axles. In other words, what I'm saying is about 90 percent of the crashes involved in this study were big trucks, way above 10,000 pounds gross vehicle weight rating.

By “cars,” we mean passenger vehicles. “Passenger vehicles” are defined as including passenger cars, pickup trucks, vans, SUVs and motorcycles. How come we use “cars” here, not just “passenger vehicles”? Well, it turns out that “cars” is a lot easier to put at the top of a PowerPoint slide than “passenger vehicles,” as you'll see.

SLIDE 3: CODED CRASH VARIABLES

In the study we coded three classes of crash variables.

The first is the critical event. “Critical event” is an event that makes the crash unavoidable. It puts the vehicles on a collision course. The crash is a direct result of critical events. It’s based on vehicle movements. One or more of the vehicles made a movement that made the crash unavoidable.

Secondly, we coded the critical reason for the critical event which is the immediate reason for the event. Just like the critical event is *what* happened, the critical reason is *why* it happened. “Critical reason” is coded to only one vehicle in the crash. That vehicle is a given credit—or fault for causing the crash.

Thirdly, we coded over 1,000 associated factors. Each of these factors was coded when they were present, not that there was any judgment that they were responsible for the critical event. They were all factors that could be important in a crash: drugs, alcohol, fatigue, inattention, distraction, mental state, brakes, lights, snow, potholes, factors related to the driver, related to the vehicle, related to the roadway, related to the weather.

All of these—well, just like the critical event is *what* happened, the critical reason is *why* it happened—the “associated factors” are *possible explanations* of why the critical event happened. Each of these factors has an implied hypothesis. They are factors that we believe might be reasons to explain why crashes happen. We coded over 1,000 factors. We didn’t look at factors such as hair color, horsepower, the color of the vehicle, type of roadway barriers, etcetera.

SLIDE 4: CRITICAL EVENTS

Let’s look first at critical events. Remember that these percentages are what we estimate happens every year on the highways in crashes involving a single large truck and a single passenger vehicle. Now you can see how “cars” fit much more nicely over that first column than “passenger vehicles”.

We estimate that there are about 50,000 crashes every year between a single truck and a single car that result in either a fatality or an injury. About 3,000 of these 50,000 crashes are fatal crashes.

The percentages in these columns for the trucks and cars are the critical events coded to the cars and trucks when those vehicles were also coded with the critical reason. For example, all of the trucks in the first column—the percentages there refer to the percentage of trucks that got the critical reason and these were the critical events that they were involved in. Some of these need very little explanation; others need a lot or some explanation.

“Running out of the travel lane” means you went over the median, you went out of your lane, or you went off the road. “Other vehicle stopped in a lane”—the example could be that a vehicle stopped at a red light and you hit it. So the other vehicle was stopped in the lane, but you got the critical reason for the crash, because you shouldn’t have hit a vehicle stopped at a red light.

“Crossing through an intersection” seems fairly obvious. “Traveling in the same direction—slowing”—if you are traveling down the highway, you slow for no good reason, and you get rear ended, you would be coded with the critical reason, not the vehicle that hits you. “Traveling too fast” is obvious. “Turning left at intersection”—you might have turned against the light. “Jackknife”—that’s applicable to trucks. I guess you can jackknife a car, but if you’re in a car and it gets jackknifed in a crash you’re in—you’ve got a real problem. And then “other reasons.”

One of the things to notice is that for a lot of the reasons there is very little difference between the cars and trucks. There are significant differences, though. “Other vehicles stopped in lane” is one. It’s a lot more difficult for trucks to stop if they have to, than cars because they are so much bigger. A lot of the percentages are in cars run out of the lane, travel-lane or off the road more often than trucks.

SLIDE 5: CRITICAL REASONS

Critical reasons. In all of the crashes in the large truck causation study—now we’re counting all the crashes, not just the single-vehicle truck crash/car crashes. In 55 percent of the cases, the truck was coded with the critical reason for the crash, in other words, in slightly over half the crashes, the truck was coded with a critical reason.

However, in two-vehicle crashes involving one truck and one passenger vehicle, 44 percent of the time the critical reason was coded to the large truck and 56 percent of the time to the passenger vehicle. So if you, as many people, use critical reason as a surrogate for fault in crashes involving one large truck and one passenger vehicle, passenger vehicles are slightly more likely to be the reason for the crash.

So if we want to prevent crashes between a large truck and a passenger vehicle we’ve got plenty of room to focus attention on both vehicles because even at 56/44, it’s not like it’s 90/10 on one side or the other. Trucks and passenger vehicles have plenty of mistakes to go around, especially when you’re talking about 50,000 crashes a year.

SLIDE 6: CRITICAL REASONS

Let’s look at some of the types of critical reasons. The first four critical reasons here relate to the driver and I want to explain what we mean by them.

The mistakes that you can make as a driver—first, you could be non-performing for some reason. If you are asleep, you can’t perform the driving task. If you have an epileptic seizure or you’re in diabetic shock, you cannot perform the task of driving. If you have a heart attack, you can’t perform the task of driving. That is what “non-performance” means.

Let’s say that you’re performing. The second mistake that you can make is that you can fail to recognize what’s going on. You can be inattentive, you can be distracted, you can fail to surveil the scene correctly; as you know, we’re all supposed to have a wide scope of view when we drive; not just focus directly in front of us.

Let's say you are performing and you're recognizing the situation correctly. You can make a bad decision: you could decide to speed; you could decide to drive aggressively; you could decide to drive too close; you could misjudge a gap or another vehicle's speed; you could make an illegal maneuver. I am reminded of one crash where we had a police car who was on call and thought that by going to the left lane and then going back into the right lane he could get through an intersection and on to take care of his business. He misjudged the gap and crashed into a car in the lane before he successfully got through the intersection.

Let's say that you're performing. You're recognizing the situation correctly. You're making good decisions, but you make a performance error. You overcompensate for a problem; you panic and make a mistake. Notice that the four driver factors are overwhelmingly the critical reasons both for trucks and for cars when they're involved crashes with each other. For trucks, 87 percent of the time when the truck gets the critical reason, it's a driver problem. For cars it's even a little larger—it's 89 percent of the time. The difference is largely explained by the fifth line under vehicles. Trucks are coded with vehicle problems twice as often as cars. Only eight percent versus four percent, but it's twice as often. It seems fairly obvious why that's true. Trucks are larger, bigger, more complicated, weigh more, have more brakes, more lights and in combination vehicles you are trying to make sure that neither part of the total vehicle gets out of control.

Environment and roadway weather conditions play a relatively small role over all and not much difference. And then the unknowns, probably because this is a truck study and our researchers paid a little more attention to the truck rather than the passenger vehicle.

SLIDE 7: ASSOCIATED FACTORS

The third thing we coded were associated factors. These factors—this is a two-slide chart. There are 24 factors and these are the first 13. These factors are ranked by the percentage of time they were coded to the trucks. Now you can code many factors to a single vehicle in our study. You weren't limited by the number of factors that you could code to a vehicle. That's why these numbers add up to a lot more than 100.

The number one problem coded for trucks was brake problems; were coded for 27 percent of the trucks. That's everything from having a single brake out of adjustment to having the brakes fail. That's a wide range of problems. Cars only 2 percent; brakes are not a big problem with cars.

On this list, all of these factors are statistically linked to the coding of the critical reason. We'll talk more about that later. If, by chance, you read the report to Congress, the number one factor that showed up for both cars and trucks in crashes involved the taking of legal drugs. We're all on drugs. We all take drugs these days—over-the-counter drugs, prescription drugs, and then some people take illegal drugs, but that's a small percentage of the people. Almost everybody is on some kind of legal drug these days and that showed up a lot. That wasn't statistically linked to the coding of the critical reason, so it's not here, and I'll explain that later.

Let's just look at these. Of the 24 factors here on this slide and the next, there were seven of these factors where either the truck or the passenger car was coded considerably more often.

The first one is “brake problems” considered coded a lot more often for trucks. Second was “unfamiliarity with the roadway,” the fourth factor down. Truck drivers were coded as being unfamiliar with the roadway in 19 percent of the crashes and the cars 10 percent. That makes a lot of sense, because truck drivers are often driving where they don’t know where they are, or they haven’t been there before. Whereas most of us are driving cars around our neighborhoods and places we are familiar with.

The third factor is making an “illegal maneuver.” Trucks were coded 12 percent of the time; cars 18 percent of the time—50 percent higher.

The next one, “felt under work pressure.” This makes sense, because the truck drivers were working at the time; most passenger cars were not. We did have cases of passenger car drivers saying they were under work pressure. I remember a crash where a traveling salesman had been on the road for a very long time. He would’ve been over his hours of service if he had been a truck driver. He failed to slow for a truck that was stuck in congestion and rammed into the rear end of the truck. He felt under work pressure to get to his next meeting.

Then “fatigue.” In the case of fatigue, truck drivers were coded seven percent of the time as being fatigued, passenger car drivers 15 percent of the time. This is something you might not expect because we hear a lot about how fatigue is a problem with truck drivers. Yet in these crashes with cars, it was twice a big of the problem for the passenger vehicle drivers.

Let’s go to the next slide.

SLIDE 8: ASSOCIATED FACTORS (CONT’D)

The last two on the bottom, where the other ones were about a five percentage point difference between trucks and cars—taking of illegal drugs for truck drivers, 0.4 percent of the time and for car drivers, seven percent; alcohol use 0.3 percent for truck drivers; nine percent for car drivers.

When truck drivers go out to recreate at night or on weekends, they might take some illegal drugs or drink alcohol, but truck drivers aren’t silly enough to be taking illegal drugs and using alcohol very often when they’re at work. What we know about passenger car crashes is that about half of fatal passenger car crashes take place at night or on weekends when people driving passenger cars are out having a good time, which is when they are likely to be doing things they shouldn’t be doing, such as driving fatigued, taking illegal drugs and using alcohol.

Sixteen of the 24 reasons or factors on these two charts relate to the driver. Both trucks and cars—there were brakes and tires coded. With trucks there’s being overweight, jackknifing and cargo shift.

That’s consistent with what we found out in the critical reasons were linked to drivers and so the associated factors.

SLIDE 9: RELATIVE RISK

Now we know the critical reasons, the mistakes that are made by both car drivers and truck drivers when they collide with each other. We know the associated factors which can be explanations for the mistakes. The question now is, “Which factors produced the mistakes? Which factors are linked to the mistakes?” There are two things important about associated factors. The first one is how often they occur. We just saw that in the last two slides.

We know how often the major factors occurred. Now the question is “How dangerous are they?”

Relative risk analysis tells us how dangerous factors are by linking factors to the critical reason, and I’m going to use fatigue as an example here.

We saw that truck drivers were coded for being fatigued seven percent of the time; it was actually 7.3 percent of the time. Let’s think about those truck drivers who were coded as being fatigued. Of those drivers that were coded as being fatigued, 75 percent were coded with the critical reason for the crash. Twenty-five percent were not coded with the critical reason—the passenger vehicle was coded with the critical reason for the crash even though the truck drivers were fatigued. If you divide 75 percent by 25 percent you come up with 3.0. That’s the relative risk ratio. You are twice as likely—taking away the one because if you have a factor of one-to-one, it means it did not have an impact—twice as likely to be coded with the critical reason in a crash with a car if you are driving fatigued.

Let’s look at the car drivers. The previous table showed that 15 percent were coded as being fatigued. It’s actually 14.8 percent of the time. When those car drivers were coded as being fatigued in crashes with trucks, 92 percent of the time the car driver got the critical reason. Eight percent of the time, they did not get the critical reason, even though they were fatigued. If you divide 92 by eight, you come up with 11.5. If you are a car driver, you are ten times more likely to be coded with the critical reason for a crash with a single truck if you are involved in a crash with a truck.

I hope that’s clear, let’s leave this up for a minute. The idea is that you look at a factor. You look at how often it is coded and then you look at when it is coded—how often the driver that’s coded with the factor also gets the critical reason for the crash.

Let’s take that truck driver up here. Let’s say that of those 7.3 percent of truck drivers that are coded as being fatigued. What if 50 percent of them were coded with the critical reason and 50 percent were not coded with the critical reason? Then your relative risk number would be 1.0. That would mean that fatigue plays no role in crashes between trucks and cars.

That’s why, if you read the report to Congress and you saw that taking prescription drugs and taking over-the-counter drugs were the single biggest factors for truck drivers and car drivers involved in crashes, that’s why they don’t show up in the analysis here—because what we found is that of the 30 percent of the drivers taking prescription drugs, 50 percent of them were coded with the critical reason and 50 percent weren’t coded with the critical reason. Therefore taking legal drugs either over-the-counter or prescription, really had nothing to do with explaining the reasons for the crash.

We all know that within the category of over-the-counter drugs and prescription drugs, some drugs might have the ability to change behavior and some drugs don't. For instance, it says on Benadryl bottles that you shouldn't take Benadryl if you're driving a vehicle, which I didn't know until my wife pointed out to me. It is dangerous to take Benadryl if you are going to drive. We have funded an analysis by a firm that has done work in the drug area for other modes of transportation to look at this data. They did find a link between certain types of drugs which can change behavior and the assignment of critical reason in crashes. We're going to publish that later this year. But overall, it didn't show up. The important thing is how often a factor occurs and how dangerous it is. The percentage of time you code a factor shows you how much it shows up. The relative risk analysis tells you how dangerous that behavior is.

SLIDE 10: TOP 10 "CAUSATIVE" FACTORS - TRUCKS

Looking at both the amount of time a factor shows up and how dangerous it is—these are the ten top causative factors for trucks when they're involved in crashes with a single-passenger vehicle. The most dangerous thing is being overweight. Overweight didn't show up much in that table—only five percent of that time—but it was a very dangerous behavior. When a truck is overweight (and you know how tall trucks are). If they're overweight, that makes them extra—more likely to roll over and more unstable. It is a very dangerous behavior. So that shows up as the number one causative factor for trucks.

The only other vehicle factor in the top ten is brake problems, which is at the bottom. Brake problem was coded 27 percent of the time, but remember I said that by brake problems we meant everything from a single brake being out of adjustment, to brake failure. Brake problems in general did not have a very high relative risk ratio and turned out to be not as important as a lot of other factors. Every one of the other causative factors among the trucks relate to the driver—an illegal maneuver, inadequate surveillance, traveling too fast, inattention, following too close, misjudging a gap or somebody's speed, a stop required before a crash that you didn't notice, and external distraction.

A distraction can be both internal or external. By external distraction we mean something outside the vehicle that distracted the driver. By internal distraction we mean something inside the vehicle that distracted the driver. So, eight of the ten are driver factors.

SLIDE 11: TOP 10 "CAUSATIVE" FACTORS - CARS

When we look at the passenger vehicles involved in these crashes, all ten of the top-10 factors are driver factors, but they can be divided into two categories.

NHTSA, the National Highway Traffic Safety Administration, has a phrase called "inside the crash envelope." That means what happened at the immediate time of the crash that was important in the crash. The factors that weren't at that particular time but earlier in time—they're "outside the envelope." About four of these factors are something that happened outside the envelope, way before the crash. These are alcohol use, fatigue, illness and taking illegal drugs. By the way, you could have been drinking the alcohol as you're going down the road, but what we normally mean here is that the person was drunk or was impaired by the time he got into the

crash envelope. Fatigue, obviously, is something that had to build up over time; being ill, unless you got ill at that direct moment, probably took place ahead of time; and the effect of taking illegal drugs, too.

The others are all mistakes made within the crash envelope: making an illegal maneuver, misjudging the gap, inattention, internal distraction. With cars, external distraction does not show up but internal distraction shows up. Everybody wanted to know about cell phones. We didn't find much cell phone problem in this study, but way before cell phones, there were a lot of other things inside a vehicle that could distract you, such as a passenger. I remember in 1969 or 1970 driving across country with my girlfriend from St. Louis to New York, I noticed that when I was talking to her I wasn't paying full attention to the road. When I wasn't talking to her, I was paying full attention to the road. Just talking to somebody else in the vehicle is probably the major thing that distracts people when they drive; or listening to the radio; or fumbling with the radio; or eating a McDonald's sandwich that you just picked up; or trying to straighten other things up; or looking in the mirror at your hair or something. There's lots of ways to be internally distracted outside of cell phones.

Internal distraction shows up for car drivers; external distractions shows up for truck drivers. These are the top ten causation factors. With regard to the truck drivers, there were no outside the envelope driver factors that showed up. Let's go back to that previous slide.

SLIDE 10: TOP 10 "CAUSATIVE" FACTORS - TRUCKS

All of these are all the driver factors here. Factors two through nine are things that happen within the crash envelope. There's no drugs, alcohol, sickness, fatigue that shows up in the top ten factors. It's all mistakes—problems within the crash envelope. Then you've got the two-vehicle problems.

SLIDE 11: TOP 10 "CAUSATIVE" FACTORS - CARS

With cars, almost half of the time it's factors that took place before getting in the crash envelope. Then you've got the usual crash envelope.

Let's go to the next slide.

SLIDE 12: SUMMARY

To summarize—I left buses in there; buses shouldn't be in there.

To summarize, there's plenty of blame for large trucks and passenger vehicles in crashes between the two types of vehicles. The causative factors lie mainly with the drivers. Truck drivers are in better physical shape than passenger vehicle drivers. That's counter intuitive because we think of truck drivers as being late middle aged, fat guys who have sleep apnea, etcetera, etcetera. They might be in overall worse shape than the general population, but they're in better physical shape for driving. They're not drinking. They're not taking drugs. They're

getting more sleep. They're working. They're more serious about being in good shape for driving than car drivers.

On the other hand, truck drivers make more mistakes than passenger vehicle drivers within the crash envelope, which is also sort of kind of counter intuitive because we think of truck drivers as being very skilled drivers and they are very skilled drivers, but they are driving a large vehicle that is much more difficult to control and not as maneuverable, obviously, as a passenger vehicle driver.

Vehicle issues are secondary. They're more important for trucks than passenger vehicles, but they are still largely secondary.

SLIDE 13: STRATEGIES TO EXPLORE

These are possible strategies to explore when FMCSA tries to prevent truck crashes—all truck crashes; particularly crashes with car drivers.

We could focus our programs more on drivers. Focus on drivers during roadside inspections. Do more driver inspections on roadside inspections than vehicle inspections. Focus more on drivers when our staff does compliance reviews with carriers. Focus more on truck drivers with our outreach programs—instead of emphasizing brake maintenance, emphasize driver factors. We can emphasize the importance of driver factors with other agencies involved in highway safety, such as NHTSA. Federal Rail is very interested in highway safety because of crashes at grade crossings. We could focus more of our problems on drivers.

Secondly, we need to make sure that the CDL program is accessible and used. I think I made a mistake there—it is supposed to be “Make sure the CDL program is *effective* and used.” There are a lot of concerns about cheating with regard to CDL. Drivers bribing State officials to give them CDLs and buying their licenses rather than demonstrating skill, and other problems with States exchanging data so that we make sure that the violations that drivers are convicted of get on their records and then making sure that States take action against the drivers that have problems.

The third thing is to develop a driver rating system. We have a system which rates every motor carrier in the country and gives them a score between zero and 100. We need to develop that kind of a system to rate drivers too, since drivers are an extremely important part in truck safety.

Fourthly, we could promote more human factors research. We don't know a lot about the ability of the brain to concentrate for hours on end on a particular task. I'm sure you've known people who seem to have the ability to concentrate more than other people. We're asking not just truck drivers but passenger vehicle drivers to be able to concentrate exclusively on a task over a period of time to make sure that they behave in a safe manner.

And fifth, we could narrow the scope of our vehicle inspections to the items that seem to cause more crashes, such as brakes, tires, and lights show up every so often, not much but they do show up—the conspicuity of trucks. Brakes are obviously number one by far; tires have problems and lights have problems.

Let's go back—I want to go back to the causative factors for truck drivers.

SLIDE 10: TOP 10 “CAUSATIVE” FACTORS - TRUCKS

One of the things that strike me about this list of the factors for truck drivers is that these are the problems. Eight of the ten are vehicle problems. It's very difficult to outlaw some of these problems. Can we make it a crime that people inadequately surveil the crash scene? Can we make it a crime that they don't pay attention? Can we make it a crime that they're not good enough to—that they made a mistake in misjudging a gap or somebody else's speed? Can we make it a crime to look at things that might distract them outside of a vehicle? A lot of these things seem to me, this is just a personal reflection, to be beyond the ability of Congress to legislate or FMCSA to regulate, because it involves human behavior, making choices, making safe choices and then following through on them so you don't get into one of these kinds of problems.

SLIDE 11: TOP 10 “CAUSATIVE” FACTORS - CARS

The same thing is true for the—look at the causative factors for cars. The same thing there. We can't, we're not going to legislate—there has been some legislation about talking on cell phones I know. We're not going to legislate that people shouldn't talk to other people in the car; that they shouldn't listen to the radio or change stations; or listen to a CD and refrain from singing along. It just seems like an awful lot of the things involve human behavior and choices that the ability of Government to influence is limited. Therefore, that increases my belief that we need to do more research into basic human behavior and how we can convince human beings to be safe and do the safe things above and beyond what we can legislate.

SLIDE 14: CONTACT INFORMATION

That's my contact information. Did we get up a slide with the Website?

Kirse Kelly:

Yes, the Website information will be put up in just a little bit, actually at the very end when we ask you to fill out an evaluation we'll also include that that information for the Large Truck Crash Causation Study Website.

Dr. Ralph Craft:

Let me explain. The Website—the LTCCS has its own home page on our Website. There are a number of things in the Website. First of all, there is the report that we made to Congress and an Overview of the Study which I wrote. There's also an Analysis of a Methodology of the Study drafted by Dan Blower from the University of Michigan Transportation Research Institute and Ken Campbell, who is now at TRB. Also, there's an Analysis Brief on using data from the study authored primarily by Jim Hedlund of Safety North, a retired NHTSA employee who co-authored it with Dan Blower.

And we actually have the database of the study up on the Web. It's a downloadable data base so you can download the data from the study and then there's a User's Manual on how to use the data and a Code Book, also. You can look at the data and analyze it yourself. Because we promised anonymity to people involved in the study, you will not find the names of trucking companies or the names of individuals involved, and you will find all references to exact location eliminated from the study.

In addition, we are about ready to make available to the public an XML viewer which will allow individuals to look at specific crashes. One of the reasons we wanted to make all this information available to the public is, if anybody out there disagrees with our conclusions—which of course are absolutely correct—but if you disagree, you have the ability to go in and analyze the data and look at the data in a different way than we did, and you might reach different conclusions. When the XML viewer is out, you can look at cases. Each case has over 100 pictures, a scene diagram and just a ton of information about the crash and all the factors we coded. You can take those crashes and reach your own conclusions about it. We've analyzed the data one way in the presentation I've made today using relative risk analysis to spot factors that are important in crashes. You can look at the data and analyze it in another way. We've already had a study of crash rollovers where a researcher just looked at individual cases to discover what he thought were the reasons for crash rollovers and gave a report at TRB in 2007 on that data. We invite you to use the data, use the type of analysis we do, but also analyze the data in other ways if you'd like to. I would be ready to answer any questions anybody has.

[44:50]

QUESTIONS AND ANSWERS

Kirse Kelly: At this time, if you would like to ask a question, you can submit them in the **Q&A Box** which is on left side of your screen or you can ask questions over the phone. You just press * 1 and state your name to the recorded message. When your line is open, Carol, our phone operator will announce you by name so please state your name clearly for the proper pronunciation. Questions are going to be answered in the order that they are received. Once again, please note that you'll be given the opportunity to download a copy of the presentation at the end of the webinar. If you do need to logoff early, before the questions are all answered, you can logon later this week and the presentation will still be available to download.

Gerald

Donaldson: *How do you respond to the critiques of the LTCCS by TRB, the CDC and advocates for Highway and Auto Safety that demonstrate the severe inadequacies of the LTCCS, including its database and the inability of FMCSA to rely on the study for making any regulatory or other policy decisions?*

Dr. Ralph Craft: That's a long question, obviously. We thought that the CDC did a good analysis of the study. The criticisms in that study—two of the criticisms were valid; two of the criticisms related to we didn't have a big enough sample. We did over 1,000 crashes—about 1,060 crashes, and then had to eliminate a number of the crashes because we didn't have enough data or they were practice cases. We ended up with 963 crashes. The largest crash causation study done on truck crashes before ours was about 280 crashes in an NTSB study. The study was large enough to allow us to reach the conclusions that we did. If you look at the analysis of Jim Hedlund and Dan Blower on the study—on the use of the data—they concluded that the use of the study with regard to relative risk analysis was perfectly valid and that the conclusions that we reached were valid. The CDC made one mistake. The CDC said that we were relying exclusively on the critical reason as the total focus of the study. As you just heard, we focused mainly on the associated factors; not the critical reason in the study.

The study has been used by FMCSA to make a number of changes without seeking regulatory action. For example, we have oriented—if you looked at the list of strategies to explore—we are focusing more on drivers during our roadside inspections and compliance reviews and our outreach. Secondly, we're looking at making the commercial driver's license system more accessible. We just put out a regulation to plug up a loophole which allowed people that got practice CDLs to get one without meeting the requirements that you had to get a real CDL; we are changing that. We are undertaking audits of the CDL program to make sure it works better.

We are developing a driver rating system. We can't go public with that until it meets the requirements of good data, but we're working on developing a driver rating system.

We have proposals to promote more basic human factors research beyond what we already know. So we have shifted our focus much more towards the driver as a result of this study. If you read the CDC report on the study, it's a good report. It's only three or four pages long. I would be happy to send it out to anybody. It's a decent report. They just made the one mistake, saying that we focused exclusively on the critical reason and that's not the case.

The TRB did not issue a single report on the study. They issued a number of letter reports after each time we met with them, and we met the critiques in those reports. Those reports are a rather lengthy. I think there were five or six of them because we had five or six meetings.

The Advocates for Highway Safety we believe had an axe to grind, and we have not taken the time to respond to their critique of the study.

I encourage anybody that wants to, to read the CDC report. I'd be happy to send it to them.

Ken Turner: *How do you propose to change behaviors?*

Dr. Ralph Craft: The short answer is, I don't know. If you look at the attempt, the very strong attempt by NHTSA to convince people not to drink and drive, there has been some progress made, but it remains a major problem. Sixteen percent of the people who die in highway crashes, die in crashes where there was at least one driver who had consumed alcohol. It's tough to do. We have to do more research into behavior modification; into promoting safer drivers. That's the most difficult thing for me to think about, is how we can change human behavior so we can produce safer drivers. Can we have an easy question next?

Kirse Kelly: Carol, are there any questions on the phone line at this time?

Operator: Yes, we do have a couple.

Tom Berg, your line is open.

Tom Berg: *Hi, it's Tom for Heavy Duty Trucking. Regarding what should be crimes under motor vehicle codes, inattentive driving, which could be construed as a number of things, including cell phone use, is illegal in some states, but not in others. It seems to me that it ought to be illegal in all states. What do you think?*

Dr. Ralph Craft: Yeah. In fact—and I just remembered too that New Jersey outlawed driving while fatigued recently. Maybe some things can be done in that, but that's got to be very difficult for an officer to try to figure out, if somebody was inattentive or even fatigued. If you're fatigued and you're in a crash, all of a sudden your adrenalin kicks in, and right after the crash you are not fatigued anymore. There might be something we can do in that area, but those are much more difficult things to do. I think one of the reasons—and this is just my personal opinion—we have historically focused on vehicle factors is that you pull over a truck and you can see if the brakes work or not. If you are examining the driver, you can look at the logs and can look records and stuff like that, but how are you going to you look at a driver and tell if this is a driver who is going to be attentive or is not going to be attentive? How can you make the decision after a crash whether somebody was or was not inattentive? Those kinds of things are extremely important questions.

The reference to the TRB report in the first question—there wasn't a single TRB report on the study, as I said—but we had a TRB review team that worked with us and would meet and review our work all along the way. There was a gentleman on the review board from the California Highway Patrol and he told a story. He came across a crash once where a guy had just totaled his car, but the guy walked away from it. The officer got there right after the crash happened. He goes up to the driver, and the driver is bitching and moaning about his wife. He had just been in a huge argument with his wife. The trooper said, "Do you think that has been a thing to do with the crash?"

Here's the driver that was being distracted from driving because he was reviewing in his mind an enormous argument that he'd just had with his wife. So you have to be in a good mental state to drive a vehicle, in addition to all of the physical stuff.

Kirse Kelly: Is there any other questions, Carol?

Operator: Yes one moment. Dan Giles your line is open.

Dan Giles: *This is Dan Giles with Fontaine Trailer. Dr. Craft, I was wanting to know are you aware of any other studies similar to this done in Canada or in any European countries?*

Dr. Ralph Craft: I don't know of any done in Canada. There was a study done in Europe under the auspices of a European Road Commission. They looked at large truck crashes in six countries. The conclusions were very similar to ours; it's primarily driver factors. We're going to try to get someone from that Road Commission to come talk at a conference this summer. I've got a copy of that study. If you send me your contact information, I could probably get you a copy. We don't have it electronically; I'd have to send it through snail-mail, but we could get you a copy of it. It's a pretty good study. I can't remember which six countries right now, but that is the only other study in the world that we are aware of. We don't think that there's anything like this been done in Canada.

Dan Giles: *Very good. I will send you an e-mail with my contact information, Dr. Craft.*

TJ Thomas: *Why wouldn't vehicle safety technologies such as, adaptive cruise control, lane departure warning, accident mitigation, etcetera be valid strategies to explore?*

Dr. Ralph Craft: They absolutely would be strategies to explore. All of these are aids; these don't absolutely prevent crashes. They are aides to the driver. It tells the driver when they've run out of a lane so that they can correct themselves, which is a perfectly good strategy to explore. It comes down to the human being reacting to these technologies in a positive way. How much impact those things have on improving driver behavior is difficult to know, but they are absolutely things that we ought to try.

Anthony Bizjak: *Is there any more recent data relative to cell phones, texting, driver computer data entry as distraction, as a causative factor?*

Dr. Ralph Craft: Yes, I'm sure there is. One of the first questions we answered, one of the things I should have said in response to that is that we are very pleased with the study. We think that it was a good study and essentially the CDC agrees with us. Also, the National Highway Traffic Safety Administration thought the study was so good that they duplicated it. They undertook a National Motor Vehicle Crash Causation Study which collected data from 2005

through the end of 2007 on light vehicles—in other words, vehicles with a gross vehicle weight rating of less than 10,000 pounds. I'm certain they asked about cell phone use and other distractions in that study. I don't know what they found, but they haven't put out their final report yet. If you send me your contact information, I'd be happy to put you in contact with people at NHTSA about that study.

**Karen White &
Bill Linde:**

Overweight trucks—can you provide more information as to what that includes? For example, is that over the weight limit for the road or over the vehicle's weight rating?

Dr. Ralph Craft: A vehicle's weight rating is a recommendation from the manufacturer; it's not anything written in the law. What we refer to in overweight is by breaking the law for a particular road; being overweight for that particular roadway.

Tom Berg: ***"Inattentive driving" is a motor vehicle crime in some states, but not others. Wouldn't this be a good tool for police to use against sloppy driving including cell phone use?***

Dr. Ralph Craft: Yes, I think I said this in response to one of the phoned-in questions. I think that's a good strategy to employ; I just think that that's got to be very difficult for an officer. One of the things that we have to remember about police officers is that very few police officers became police officers to collect good crash data. They became police officers because they wanted to fight crime, or they wanted to serve the community, or they wanted to—all kinds of motivations. The main job of police officers, except in those cases where you have state highway patrols doing nothing but highway safety, is to fight crime, terrorism, prevent murders, rapes, robberies etcetera. Traffic safety is pretty far down the list of what they have to do, so asking them to assess a driver about whether a driver is inattentive or fatigued or whatever, has got to be a pretty tough thing to do. But I am glad to see that some states are trying it.

Kirse Kelly: Carol, are there any other questions on the phone at this time?

Operator: Actually we do have a couple of them, one moment. Tim Bolton, your line is open.

Tim Bolton: ***Thank you. Just to follow up on the first question about cell phones. You're saying that there is only one NHTSA study that's actually addressed cell phones in particular as a distractive factor?***

Dr. Ralph Craft: Yes, I believe that's true. When I say just one study, this study collected data on about 2,000 crashes a year; very extensive data, so it's a very good study. I don't know of any other studies that have focused on cell phones, but NHTSA might.

Tim Bolton: ***If you have that reference, if I could have that to look into that.***

Dr. Ralph Craft: Certainly. Send me your contact information and I will get you somebody to talk to.

Tim Bolton: *I just had another question. Am I allowed another one?*

Kirse Kelly: Go ahead.

Dr. Ralph Craft: Sure.

Tim Bolton: *I think it was a written one that I submitted. Did you correlate at all for multi-trailers or trailers over 48 feet in the data?*

Dr. Ralph Craft: We have not looked at that question yet. The data is there to look at. The database is so enormous that we have not analyzed all parts of it. We funded a study by the University of Michigan Transportation Research Institute to look at truck factors, truck vehicle factors in the study. That report will be available sometime this summer. This is a number I call so often I don't need to look it up. You might ask that question of Dan Blower at the University of Michigan Transportation Research Institute. His number is (734) 763-6079, and you can tell him I told you to call him.

Tim Bolton: *Thank you.*

Operator: Greg Byrne, your line is open.

Greg Byrne: *I was wondering how much you have looked into telematics in taking a look at driver behavior? There are a lot of devices that measure hard brakes—your event data recorders and some other outside manufacturers that are using g-force technology and so forth to monitor unsafe lane changes, you know, those types of things.*

Dr. Ralph Craft: That's not my area of expertise here. Send me your contact information. Amy Houser, who works in our Technology Division—I am in the Research Division. We have a division called the Technology Division which does look at safety technology. I should have answered this in regards to an earlier question. We have a whole division that looks at truck technology for safety purposes. Amy Houser is the person there that I think knows a lot about this kind of stuff. I can put you in contact with her if you send me an email.

Kirse Kelly: Or you can send her an e-mail at Amy.Houser@dot.gov. Also, if you check our Website later, she does have some webinars coming up. We have webinars coming up about Onboard Safety Systems.

Anthony Bizjak: *In compiling data for this study, was there any download of data from truck engine ECMs used or available to correlate and confirm causative factors?*

Dr. Ralph Craft: No. The reason—we looked into that, but there's no uniformity in the equipment that is put on truck engines to monitor the behavior of the engine

and the braking and those kinds of things. It would have been enormously expensive to get—well, first of all, the data is owned by the trucking companies and it wasn't clear that every trucking company would allow us to use that data. Secondly, it is enormously expensive to buy all of the equipment you need to download those programs and read them because there's no standardization. And thirdly, there are still a lot of trucks that don't have very sophisticated equipment attached to their engines. For a combination of those three reasons we didn't go that route. Someday in the future, when every truck and other vehicle have some sort of a standardized system which records what their engines and brakes are doing, and it's easy to read those files with the standard equipment, and we solve the problem of, "Well, if it's my car or my truck and I own it and if I think I'm a fault then I am not going to let you see it." If we get over that problem this would be a good thing to do—but we didn't think we could do this successfully in this study.

Michael Friday: *When performing the study, was driving experience for new drivers versus veteran drivers calculated? And if so, what was the percentage for the two?*

Dr. Ralph Craft: Okay, we have that data. This relates to the question on why you haven't used this data in rulemaking. That data on driver experience was used in a rulemaking done in the area of driver training. Off the top of my head, I don't remember what that data showed and what we found out, but the data is in the database. We asked drivers how long they've been driving, how they learned to drive and questions like that about their experience. It's in the database.

Patrick Hoag: *Do you feel that uniform reporting, (i.e. utilization of a single or uniform report) would enhance your data and if so, would this be possible?*

Dr. Ralph Craft: That is an interesting question. There is a project run by NHTSA which we participate in, and Federal Highways participates in, as well as State and local police agencies around the country, to try to standardize the collection of crash data. It's called the Minimum Model Uniform Crash Criteria. A third version of this is just going to be just published this summer. There are something like 88 basic data points about a crash that it says ought to be collected on every crash in the country. If we do get more uniformity in the future, this will undoubtedly help us to more successfully analyze crashes, but there's no mandate. The Federal Government can't make every state adopt these data elements, but most states seem to be willing to attempt to collect most of this data that is recommended. We are hopeful that in the future there will be much more standardized data across the country than there has been in the past and that will help.

Erik Binns: *The focus of this and other studies focuses on the truck-side issues when the data continues to show that the drivers of cars are responsible for the majority of the accidents between cars and trucks. What strategies and actions are being suggested to help reduce passenger vehicle- caused*

incidents between cars and trucks, which logically will also reduce car and car accidents?

Dr. Ralph Craft: We have a program called TACT, T-A-C-T—I'm not sure what it stands for—where we are working with state police and truckers to try to spot problems caused by cars around trucks. It's a new program. It's in effect in the state of Washington and I think the state of North Carolina and a couple of others. That's one approach. Another, NHTSA, the National Highway Traffic Safety Administration, spends a lot of time working on issues such as alcohol and drug use and seat belt use and speed to try to get better behavior by all kinds of drivers. Since 95 or 97 percent of drivers in the country are car drivers, most of these are aimed at passenger vehicles—four wheelers. We in Motor Carriers don't spend a lot of time on that; our job is to regulate interstate trucking and bus industry, not cars, but we cooperate with NHTSA and Federal Highways. Federal Highways has a big speed campaign. They have a task force working on speed to work on some of these factors involving car drivers.

TJ Thomas: *Does each crash have only one coded-critical reason?*

Dr. Ralph Craft: Each crash has one coded critical reason, but lots of associated factors.

Kirse Kelly: Carol, are there any other questions on the phone line?

Operator: Yes, I do have about three. John Rotz, your line is open.

John Rotz: *Good afternoon. Doctor, when looking at overweight as one of the top-10 causative factors, do you have the criteria that you were looking at on that overweight? Was it over gross? Were there some oversize issues there that may have caused the vehicle to be top heavy or roll over? The reason why I ask is because here in Maryland, when we have an overweight violation, probably nine out of ten are overweight on the axle, which can have bad effects on the infrastructure, but from a safety standpoint, are probably not significant in and of themselves.*

Dr. Ralph Craft: I'm going to have to get back at you on this question. I'll have to look at the data that a little more closely to come up with the answer. I probably have your card somewhere, but you probably ought to send me your contact information.

John Rotz: *Will do. Thank you.*

Operator: Excuse me; David Simmons, your line is open.

David Simmons: *Thank you. Doctor, my question relates to the ability to use this causative data in relationship to the training and licensing of new drivers. One of the things that we see is of course, with the employment of drivers—we're hiring more and more new drivers, right out of driving school. Is there any*

ability to use any of this study data in how we can affect a licensing and training of brand new drivers?

Dr. Ralph Craft: That is a good question. I hadn't thought about that before, but one of the points you could use is—you could use this data to point out to your new drivers the kind of mistakes that drivers make that are going to get them in trouble. You can also emphasize to your new drivers that, "Look, you're the key in safety here. This is what the data shows. If you get in a crash there is a very little chance it is going to be your brakes or your lights or your tires. It's going to be something you do. Therefore it's extremely important for you to be as safe as possible." There are ways to use the data in that respect—to emphasize the importance of driver factors to the drivers and look at the specific kinds of problems they have, that the data shows.

David Simmons: Thank you.

Operator: Excuse me; Tom Berg, your line is open.

Tom Berg: It's about the driver being at fault most of the time. I have a plan for when I become king of America and that will be, that all drivers, commercial and motorists, will be required to undergo re-training every two or three years, because we all develop bad habits. We are not subject to any re-training; any reminders of how lousy we have gotten. And all of us believe we are the best drivers on the road. What do you think of that?

Dr. Ralph Craft: I think that's probably a good idea even though I just turned 65 and now I am not sure that is such a good idea.

Tom Berg: So am I.

Dr. Ralph Craft: It's interesting, one of the things that I've thought that we should pursue and we really haven't done it yet is, there are a lot of other agencies within the U.S. Department of Transportation that regulate operators of vehicles, MARAD regulates ocean-going vehicles; Federal Railroad Administration regulates train operators; the Federal Aviation Administration regulates pilots. I don't know if it is an FAA requirement or that airlines do this just as a matter of course, but they send their people back for retraining every so often. I don't think that is such a bad idea, particularly with regard to the elderly. I have a step mother-in-law that just voluntarily gave up driving; she's 97. She was smart enough to do that, but a lot of people won't do that voluntarily. My father didn't, luckily he didn't die in a traffic crash that took out a young family. That was always our concern that he would keep driving until he did something like that. I think that is a reasonable thing to require that everybody go back for training. I'm constantly telling my kids, look I know that I have a particular problem moving into lanes without looking, and I am always trying to correct it. But I might have problems, things that I do wrong that I don't know about and going back for retraining might be a good idea for me.

Gerald

Donaldson: *The CDC report stated that no two variables of interest could be correlated with sufficient statistical power. That is just a comment.*

Ken Turner: *Will EOBRs or accident video recorders be studied for causation studies?*

Dr. Ralph Craft: There are several studies that have been funded and are ongoing now that use onboard recorders and cameras inside vehicles to look at driver and vehicle behavior. Virginia Tech is conducting one, I think the University of Massachusetts is doing one and Iowa State is doing one. This is very popular now to try to do these—these are called Naturalistic Driving Studies, where you use EOBRs, as well as cameras to try to figure out what kind of mistakes are made that lead to crashes. There is a lot of that kind of research going on right now.

Robert Hale: *Were RVs excluded from the study?*

Dr. Ralph Craft: RVs were not defined as being trucks. A lot of RVs are over 10,000 pounds gross vehicle weight rating I think, but the other part of the definition had to be designed, used, or maintained for carrying property, so they were not included in the study, unless they ran into trucks. I know we had at least one crash between a truck and RV.

Gerald

Donaldson: *Another comment, there is no peer acceptance of relative risk calculations being quantified in this way.*

Ron Uriah: *Was there any breakdown in age groups and if so, what were they?*

Dr. Ralph Craft: We did not break down the data by age groups. That's one of the things that can be done from the data because we did collect driver age. Actually, we did break down age for that training rule. The data that we produced for our rule makers on the training rule, we did break down age. I can't remember what it showed though.

Erik Binns: *Please explain inadequate surveillance more fully.*

Dr. Ralph Craft: In other words, you're approaching an intersection and you're just looking straight ahead down the lane that you are in. You're not taking into account what somebody else might be doing in lanes leading into the intersection; or you're so focused on driving down a highway that you are not watching for vehicles that might come in from a driveway, or deer that might cross the driveway, or people that might get into your direct line of fire, so to speak.

Tim Bolton: *Did you correlate for multi-trailers or trailers over 48 feet?*

Dr. Ralph Craft: We had very few crashes of doubles; no triples involved in the crash. I haven't looked at that data, but we could do that.

Kirse Kelly: Carol, are there any other questions on the phone?

Operator: I am showing that no other audio questions at this time.

Tim Bolton: *Unless a surviving driver owns up, there's no practical way to show cell-phone influence, right?*

Dr. Ralph Craft: Well, let's see, if you went to the phone company, I think you could trace a call to a cell phone that was being made during a crash. I don't know the legalities of doing that. I'm sure the FBI and CIA could do it, but whether normal police agencies could do it, I don't know. But there are ways to trace calls to cell phones, and if cell phones were found in a car, you could trace a call to that number even though the driver was deceased.

Steven Belyus: *Was there a particular level of expertise for investigators of the crashes reviewed for the study?*

Dr. Ralph Craft: All of the investigators were trained NASS researchers that worked for... Let me put it to you this way, there were two types of people that we tried to get to the scene of the crash. One was a NASS researcher. The researchers were trained by NHTSA to evaluate crashes and we gave them extra training for this study over a course of several weeks to work on this study. They were all trained and experienced investigators. The other type was state truck inspectors. Most of the money that we give to states goes to pay for truck inspectors who conduct inspections of trucks. We tried to get them to the scene of the crash along with the investigator as soon as the crash happened. They did a level-one inspection of the truck and the truck driver. They took a separate two-week training course to be able to recognize pre-crash factors when you are presented with the truck in a post crash situation.

James Shafer: *Could you repeat again the definition of inside and outside the envelope?*

Dr. Ralph Craft: In other words, "outside the envelope" are factors that happened at the time before the immediate crash, such as what you were doing last night. Did you have two or three drinks with a dinner you had an hour ago? Had you been up for 18 hours in a row or did you just get up three hours before the crash? All of these kinds of factors that take place way before the immediate crash.

"Inside the envelope" are the things that happen within a minute of the crash. The two vehicles are on a collision course because of something and the drivers did or did not do something to avoid the crash and the crash happened. It's something that happened within a very short timeframe before the crash.

Michael Friday: *In your study on a critical reasons, was a study or survey completed on how many drivers had some sort of safety driver training class or classes and if so what was the percentage for those that had some additional safe-driver training compared to those that did not?*

Dr. Ralph Craft: I don't think that's something that we looked into. We looked into where the driver received their training for driving, how long ago that training took place, but I don't think we divided into types of training.

Debra Plumlee: *Were the crashes related to fatigue analyzed for sleep disorder drivers versus too many hours awake or other classifications?*

Dr. Ralph Craft: We tried to get a driver history of the sleep/wake pattern for the previous week for each driver. We also looked into the incidences of the sleep apnea and sleep disorders. To tell you the truth, the sleep pattern—I'm not so sure that the sleep pattern data was as good as it could have been because you are asking a driver to remember what he did for the past week, and when he went to sleep and when he got up, and that's kind of tough data to get.

Kirse Kelly: Are there any other questions on the phone, Carol?

Operator: I am showing that no audio questions at this time.

Shirley Seaton: *Are there any plans to further educate the motoring public on driving around trucks?*

Dr. Ralph Craft: Our Outreach Division has several programs. One is called Share the Road and we have this TACT program. We have seat belt use programs. If you want to follow up on that, send me an email. We have a whole Outreach Division which works with truck drivers and non-truck drivers on driving behavior around trucks. I could get you that information—Gladys Cole is the head of that division; I just can't remember her number right now.

Chad Crawford: *Did any part of your study focus on the years of experience driving?*

Dr. Ralph Craft: Yes, we do have data on the years of experience of drivers. I don't remember right now what the data shows, but that is in the database, the number of years that every truck driver had driven.

Erik Binns: *Has the data shown any direct relationship between Hours-of-Service regulations and any reduction in fatigue-related incidents, especially with the last round of Hours-of-Service changes?*

Dr. Ralph Craft: One of the problems with that—the time frame of the study was 2001 to 2003 before we changed the hours-of-service. We could not compare what kinds of influence the change in the hours-of-service regulation had.

Kirse Kelly: Carol, are there any other questions on the phone line?

Operator: Not at this time, no.

Kirse Kelly: We don't have any other written questions at this time, so I guess we'll wrap-up. Do you have any last things to say, Ralph?

Operator: Excuse me; we do have an audio question. Tom Berg, your line is open.

Tom Berg: *It's me again. I'm wondering about—I forgot my question! I'm signing off, I'm sorry. It's too late in the afternoon.*

Dr. Ralph Craft: You can send it to me via email anytime.

Tom Berg: *Okay, thank you.*

Dr. Ralph Craft: I guess maybe a final comment. There have been a number of questions about fatigue and obviously fatigue is a huge issue, and we found it to be an issue for car drivers in addition to truck drivers—in fact, more of an issue for car drivers. Fatigue is a tough issue because I've talked to a lot of people about fatigue, and nobody can define fatigue—exactly what fatigue means and how exactly you measure it. We assessed fatigue in our studies. I remember one case where a truck driver was being interviewed right after a crash and his story checked out. There were no eyewitnesses to the crash except his co-driver, who was slightly injured in the crash; who was in the sleeper berth, so there were no witnesses. His story checked out, his log books checked out—everything checked out, but he kept falling asleep between interviews because he was interviewed by our researcher, then our truck inspector at the scene who was a police officer, by the officer in charge of the scene. He kept falling asleep between interviews, so we coded him as being fatigued. Coding of fatigue comes down to a judgment. I remember at times feeling very frustrated that we could not completely nail it down. It's a tough issue and an important issue.

Operator: This is Carol; we do have a couple audio questions. Juan Quinones, your line is open.

Juan Quinones: *We noticed that some of the accidents were driver's inattention or distraction, and also there were some road rage-type deals. We are concerned for our drivers. Once they are out there, so they will not involved in an accident, what exactly can we do? How can we re-train them or monitor them to make sure that their driving habits or behaviors are within the company's policy?*

Dr. Ralph Craft: If I knew the exact answer to that question, I could make a lot of money. One thing you might do is talk to your insurance company. We had a meeting with insurance companies about five years ago. We asked them what they thought were the major factors in crashes and they overwhelmingly said it was drivers. They wanted to know what kind of the drivers companies hired; how they trained them; how they paid them; what incentives they gave them; how much the companies stressed safety; how they dispatched them. So when you're evaluated by insurance companies they are going to look very closely at what you do with your drivers. At least one of the companies we talked to had

developed a training plan for their clients or some training materials for their clients. It's a tough question.

I remember the story of a guy I used to work for here, who was head of an office. He used to run a trucking company and he said he was visiting a paint company to talk to them about hauling some of their paint. He walked into the company and the whole factory was closed down for that day because somebody had spilled some paint, and the company decided to close down operations until everybody was retrained in safety. He could just tell by the atmosphere in the place that they stressed safety and were very concerned about it.

My guess is that, somebody walking into a trucking company who is fairly knowledgeable about the trucking industry could tell which companies are really interested in safety and which ones might be cutting corners. The way you communicate with your drivers about the importance of safety, I think is probably going to be reflected in their behavior.

Juan Quinones: Thank you.

Operator: Excuse me; Tom Berg your line is open.

Tom Berg: Yes, it's me again. Dr. Craft, I just turned 65 also, so I forget things. I'm sure you don't though. I remembered my question relates to hours-of-service regulations and naps. As I understand it, a driver cannot log himself into the bunk at two in the afternoon because he feels he needs a nap. He cannot record that in the log book and get credit for it. If that is the case—and I believe it is—isn't that rather foolish?

Dr. Ralph Craft: I am going to take a pass on that. I did not work on the hours-of-service regulation. I could refer you to people that did if you send me an e-mail or give me a call. I'd have to refer you to our rule makers on that one.

Kirse Kelly: Are there any other questions, Carol?

Operator: I am showing no other questions at this time.

[1:33:46]

Kirse Kelly: Once again, we just want to thank you for your participation in today's webinar. We want to ask you to fill out our evaluation and let us know your comments about the webinar and suggestions for future webinars. To insert suggestions, you just type the comments at the space at the bottom of the pod, just like you did for the Q&A, and click on the arrow. The comments provided here will be viewed by all other participants in the meeting room. If you want to remain anonymous, just click on **Everyone** and instead choose **FMCSA Host**.

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Once again, we'd just like to thank you for participating. You can check out the Website as www.fmcsa.dot.gov/art for future Analysis, Research, and Technology webinars. Registration for these webinars usually opens up about one or two weeks before the webinar occurs.

Thank you again. Goodbye.

[1:34:53]