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

OFFICE OF ANALYSIS, RESEARCH, AND TECHNOLOGY

Weather and CMV Safety
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Webinar Transcript

Presenters

- Michael Johnsen, Environmental Protection Specialist, FMCSA Office of Analysis, Research, and Technology (ART)

Speakers (optional)

- Kirse Kelly, Web Conference Host, FMCSA ART

Description:

FMCSA's Analysis Division conducted a study to analyze how existing weather conditions affect commercial motor vehicle (CMV) safety and operations, and to investigate potential impacts of climate change on weather conditions. In this webinar, Environmental Protection Specialist Michael Johnsen will present an overview of the specific types of adverse weather conditions examined and how climate change may alter the distribution, frequency, duration and intensity of such weather events. It will further examine how an increase in severe storms could impact CMV practices and require responses in FMCSA regulatory enforcement.

PRESENTATION—WEATHER AND CMV SAFETY

PRESENTATION TITLE SLIDE: WEATHER AND CMV SAFETY

Operator:

Good morning. Thank you for standing by. Welcome and thank you. At this time, I'd like to remind all parties that everyone's line is in a listen-only mode at this time. During today's presentation if you would like to ask a question from the phone lines, please press ***1** on your touch-tone phone. Today's conference is being recorded. If anyone has any objections, you may disconnect at this time. I would now like to turn the conference over to the web conference host today, Ms. Kirse Kelly. Ma'am you may begin.

Kirse Kelly (Web Conference Host, FMCSA ART):

Thank you, Julie Ann, and thanks to all of you who are participating in our webinar about Weather and Commercial Motor Vehicle Safety today. This webinar is put on by the Office of Analysis, Research and Technology. As Julie Ann mentioned, time permitting, all questions will be answered at the end of the call. We will also be taking online written questions throughout the webinar. You can submit those online questions in the **Q&A** box that's on the left side of your screen, throughout the presentation. Then, at the end of the call, you'll be able to do those same online questions, or you can ask questions over the phone line.

Please note that you are going to be able to download a copy of the presentation at the end of the webinar. If you have to leave early, you can either return to this Site or we will have it posted on our Website by the end of this week, if you want to download them at that time.

Members of the trade or local media are asked to contact our FMCSA Office of Communications. That number is 202-366-9999. If you have questions at the conclusion of the webinar, just contact the FMCSA Office of Communications. Once again, that is 202-366-9999.

Finally, if you have a smaller screen and the virtual meeting room is sort of stuck on the upper-left side of your screen, you may want to try **Full screen**. What you do is you click on **Meeting** at the top of the screen, choose **Manage My Settings** and then choose **Full Screen**. Now let me go ahead and turn you over to Michael Johnson who is the Environmental Protection Specialist with the Analysis Division.

Michael Johnsen (Environmental Protection Specialist, FMCSA ART):

Hello, everyone. Thanks a lot for joining us in this webinar on Weather and Commercial Motor Vehicle Safety. This is a somewhat new topic for the Federal Motor Carrier Safety Administration. What this research project was looking to do was to look at the impacts of weather and CMV safety. A bit about myself, I am the Environmental Protection Specialist with the Federal Motor Carrier Safety Administration. I do a number of different hats, but I work a lot on climate change and issues that affect motor carrier safety concerning the environment, which is kind of a big topic these days. You can certainly, if you want, type in questions as we go along

here. I will keep an eye out on the chat box here. If I do not get back immediately, do not panic, but I will try to keep an eye on what's happening. We can, without further ado, just kind of get into this thing.

SLIDE 2: REPORT OVERVIEW

Just to give an overview on what the report's purpose is, and what we are trying to do with this thing; we really wanted to analyze how existing weather conditions affect CMV safety. FMCSA's mission is to reduce large-truck and bus fatalities, as you probably know. Weather is one of those factors. The data we looked at: we looked at crashes, CMV crashes from 75-2006 in the NHTSA FARS—that is the National Highway Transportation Safety Administration, they have a Fatality Analysis Reporting System, it's called FARS. They can code, in those crashes that occur if there's weather involved—not necessarily if weather was at fault, but if weather was involved in the crash. We normalize that data by VMT and then we popped it into a geographic information system. You will see why we did that further on.

SLIDE 3: REPORT OVERVIEW

Then, with the analysis, we compared the results with the NCDC Climate Atlas, Storms Database and also with the NTSB sources. Some of the investigation we are looking into concerning how weather might be changing in the United States and on climate change and those issues—that information is based off the Intergovernmental Panel on Climate Change and the United States Climate Change Science Programs, which just recently changed its name. Both of these sets of data are highly peer reviewed. Probably there is—with the IPCC data, there is probably no other peer reviewed, or instead, information that's been peer reviewed more in the science community than this information, so it's pretty solid stuff. That's where we get a lot of the climate change stuff from.

I'm sorry, somebody just popped in and asked what the VMT is. The VMT is the vehicle miles traveled. I am sorry that I did not actually spell that one out for you. Sorry about that.

SLIDE 4: EXAMPLES OF WEATHER EVENTS ON CMVS

Here are some examples of weather events on commercial motor vehicles. If you are driving on the roads, you probably know these things. You have rain, you have snow, you have fog, which is actually a pretty bad one. Temperature extremes can be an issue here if we have sensitive cargos. High winds have blown trucks off and actually, notably, the FARS system doesn't know whether a truck was blown off the road, but that happens occasionally, wet pavement, obviously, hurricanes, kind of a rare event, but if there's a big event like that, or a tornado. Flooding can actually impact CMV safety, whether trucks have to reroute or a vessel shipment can't go through and has to go by truck, for example, because of flooding on the river. Droughts can be problematic for the same reason—as a drought occurs in a part of the country where there's vessel traffic, and that vessel traffic then has to be dumped onto roadways on trucks. And then slides, things like snow, mud and rock slides, are really infrequent, but could close an artery down and caused rerouting.

SLIDE 5: EXAMPLES OF WEATHER IMPACTS ON CMVS

These are some of the weather events that can affect CMV safety. Then, kind of the results of that—obviously loss of traction control in snow or on wet pavement. With some of the heat stuff, you have stress that damage vehicle components, infrastructure, the cargo—if you have livestock, for example, in extremely hot weather that might affect the driver's decision about do they stop for the evening or not; or if they can with some of the sensitive cargos—hazmat, for example. You have rapidly changing conditions. This is kind of a big issue. A lot of times you have a storm that is extremely heavy and kind of comes in at the last minute that can reduce your visibility, rates of speed. If the visibility is reduced, then trucks might have accidents by not being able to slow down enough; instability of vehicles. And really on a larger scale, road closures, supply chain disruptions—any kind of modal shifts I was kind of hinting at—these are some ideas to think about when we're going into this research. There are some big impacts on mobility and safety, obviously, from the weather, so we wanted to look at that. In this document, we kind of wanted to start from ground zero and get a really wide sweep of what's happening with weather and CMV crashes. We wanted to get some of the initial statistics down and into the mix.

SLIDE 6: MOBILITY AND SAFETY IMPACTS

For mobility, about 25% of delays on the freeways are due to weather. There's estimates that total system delays cost about 1 billion hours per year and that adds some costs to the industry. You guys out in the industry—the weather is costing you almost $3.5 billion annually from some of these delays. Obviously, the safety issue, which is our primary focus, providing safety while we also maintain the mobility on the roadways. In the FARS crashes, 16% of them were associated with adverse weather. Fatal crashes for rain, snow and fog are higher for CMVs than other vehicles. We kind of took note of that.

Somebody just typed in if we include blowing dust in our analysis. Yeah, that is a visibility thing. Blowing dust or smoke from forest fires actually did come up in some of our analysis there—visibility, haze, and those kind of things.

SLIDE 7: TYPICAL SUPPLY CHAIN

So here's our typical supply chain. You are probably familiar with this if you're working in the industry. All along this, you have different ways that things can be impacted by weather, whether it's really the carriers by all types of mode, the intermodal connections, distribution centers, flooding, or that type of thing can all impact these type of operations through the entire network chain. Really, weather has an impact on all of this; we are obviously looking at the carriers and perhaps, any type of intermodal connections, mainly. Let's get into some of the data we find here.

SLIDE 8: FATAL LARGE TRUCK CRASHES VS. FATAL, WEATHER-RELATED LARGE TRUCK CRASHES

Here's where we're starting to grasp the crashes here. What we're looking at on the top line, that's our total large truck crashes from [19]75-2005. We pat ourselves on the back—everyone pats themselves on the back that are involved in the industry—these have been going down and that's great news. We just got some latest data that that trend has been continuing. If you look the weather-related crashes, it follows that same type of downward trend. Unfortunately, though, they seem to be leveling out a little bit. That's one of the things that made me take note that if we have a challenge in reducing CMV crashes, if for some reason, weather-related crashes creep up or remain the same, that just further hampers our ability to reduce that total crash number on that top line.

SLIDE 9: FATAL LARGE TRUCK CRASHES VS. FATAL, WEATHER-RELATED LARGE TRUCK CRASHES

So, in this next picture, what I wanted to do is kind of show is kind of show, on that top line is our total fatal CMV crashes and those are that same line that you saw before. On the bottom line, that would be the line if you could remove all weather-associated crashes from the total. You can see that we would have a fairly significant drop in our curve if we could somehow wave a magic wand and no trucks or buses crashed due to weather, or having that as a component. There has been some investigation as to does the weather cause these crashes. In the Large Truck Crash Causation Study out of our office, that placed weather as a primary event in a small portion—I think it was two or four percent. I can't remember right now. Some of those things are, was the driver driving too fast for conditions? So, if there was a snowy condition and the driver was driving too fast, it would have coded as something else other than weather even though the ice or the inexperienced driver driving in a blizzard may have had a big impact. We kind of got stuck with FARS just coding and understanding that yes, these crashes are just associated with weather.

SLIDE10: FATAL, WEATHER-RELATED CMV CRASHES BY TYPE OF WEATHER EVENT

If we look at some of these other charts here, it's a little confusing, but the main thing here to look at is in general, most of these things are dropping, although fog-related crashes and wet pavement-related crashes are kind of staying even here. Wet pavement ones, the snow related, kind of going up and down a little bit, but generally a downward trend. Rain related, generally a downward trend, this may be due to better technologies on trucks. Obviously, again, we have our weather-related, per one-millionth VMTchart; you can see it is starting to level out there on the bottom, from about the 90s on.

SLIDE 11: FATAL CMV CRASHES IN ALL ADVERSE WEATHER OR ROAD SURFACE CONDITIONS

We take all of the crashes that are weather-related that we have in our FARS system. The fatals are actually geo-coded, so we know where in space these occur and we pop them into a map of the United States. What we have here is all of the crashes that are associated with weather in the

FARS database. Each of the different symbols show a different factor, whether it's rain or fog, or sleet and snow, and those type of things. This map looks a little confusing, so what we have to do is kind of break this out to start to get an idea. Obviously, on the East Coast, east of the Mississippi, we have a lot of these crashes going on, a lot of the fatal crashes happen there [because of] congestion and traffic. Things open up out in the West. What we do is start pulling these things out.

SLIDE 12: CMV CRASHES IN RAIN AND ON WET PAVEMENT AND U.S CLIMATE ATLAS

Here, we look at rain and wet pavement. Here on the right-hand side, we have just a map of the U.S. from the U.S. Climate Atlas, so you can see where the rain is happening Oviously the blue and green, it's raining there and obviously, in Texas and New Mexico it's not raining there, and that's the yellow and orange. What I have circled are some clusters. We see some action on this up in the Pacific Northwest. That makes sense because we get a lot of rain there. Actually, I think it's kind of strange, that down in So[uthern] Cal[ifornia], we have a lot of these kinds of crashes, fatalities, on the rain, from the rain and the wet pavement. When you look that the map over here, you're not really seeing the rain happening. Maybe folks are less experienced driving in rain. Maybe you get just a small amount of rain that pulls the oil up from the roadway. That's a prime example of what's going on here. Obviously, over here, you have a lot of heavy precipitation happening on the East Coast and you have a really major corridor going down the coast there. That is really not a surprise, but it does show us an area that we want to focus on if we want to deal with wet pavement crashes—fatalities from that.

SLIDE 13: CMV FATAL CRASHES IN SNOW, SLEET, OR ON ICY PAVEMENT AND U.S CLIMATE ATLAS

This slide, we have over on the right-hand side, another map of the United States and this shows where it's snowing or sleeting. Obviously, up North it is snowing or sleeting. It is kind of a nice band of where you can get some sleet or icy pavement bands. These are pretty self explanatory. Then over on the left-hand side, again, we can look at where some clusters are happening. Here's an interesting one. I think this is kind of what we are trying to get at with some of this research. Along this route here, going across the Rockies, there are a lot of crashes due to snow or sleet or icy pavement. You have almost a corridor analysis starting to happen here. We can look into this a little bit more, but here is a prime area that we might want to focus on some type of technology in order to alleviate that situation. Over here in the East, you get the lake-snow effect, so you're getting a lot of snow over here, kind of a cluster. Again, a high density, a lot of the material here in the Cascades, you have some incidents happening, not too bad in these other parts. It's rare that it snows down here, but you do get some crashes down in Texas due to this. Maybe that could be inexperience. Maybe driver education is a part of this. These kind of questions are what we are trying to tease out from presenting this information and kind of hypothetical right now.

SLIDE 14: CMV FATAL CRASHES IN FOG AND OTHER VISIBILITY HAZARDS AND U.S CLIMATE ATLAS

Let's look at fog. Fog is actually a big problem and you've probably heard about these crashes, huge pileups happening in Southern California. When you look that the map, you do get a little bit of fog and stuff out there, the yellow and lighter blue that you kind of see on the coast mean more fog. Whereas, in the center of the country, you're not getting a lot of fog. You can really see these clusters happening in L.A. and Southern California when you get the big pileups. I think this cluster down here in Florida—when you look the map, you don't see a lot of fog happening in Florida, but I think down here that was due to some fires that were happening down in Florida. It is a visibility hazard, and the question about if we look at dust and stuff—that would be a visibility hazard. Here we have a little bit of a cluster of a foggy area, but really not that bad even though it shows that you can get some fog in the Appalachians along that corridor. Of course, a fairly foggy area in the Pacific Northwest. If you look at this little spot here, that's a lot of fog. You do get some crashes, but not as many associated with say, Southern California. Perhaps this area has some type of method for dealing with foggier areas or fog problems, some type of IT solution perhaps, and signage that we could maybe use in other parts of the country where we see these problems—just another hypothetical idea about what this data might be able to lead us to.

SLIDE 15: LOCATIONS OF FATAL CRASHES INVOLVING COMMERCIAL MOTOR VEHICLES BY WEATHER EVENT

We put this all together and we have locations of fatal crashes involving commercial motor vehicles by weather event. We can really start seeing a picture here. Up in the Pacific Northwest we have fog and wet pavement issues. We have a corridor analysis on this one roadway, I-80; here, obviously, some big problems with the snow and slippery pavement. We've got the fog problem out in California, Southern California, that's kind of surprising; wet pavement issue down in San Diego—I don't associate San Diego with a lot of rain. Obviously, on the West Coast, you can see some big clusters, snow and slippery pavement issues, particularly this one here is right off the lakes. On the East Coast here, rain and wet pavement issues, this is between Boston and Washington DC, probably I-95 and all the congestion around the big cities on the East Coast. Then fog issues that we have, some in the Appalachian and down in Florida with the fog and visibility issues. You start seeing a map where we can start identifying where some of these problems may be occurring if you want to work on a very specified area.

SLIDE 16: CMV WEATHER-RELATED CRASHES BY SELECTED INTERSTATE HIGHWAYS

Going one-step further, we can just look at some highways and what is happening on specific corridors. Again, here is that I-80—this is something that we probably want to get a little bit into so we can look at a particular highway section, see what type of events are happening on there. If you want to do signage or some type of telemetrics, or vehicle-to-vehicle IT information—perhaps a vehicle in the front can warn vehicles behind that there is a weather event that they need to be aware of, things like that. Those are all possibilities. When we start looking at roadway analysis, you've seen enforcement guys out there, you might be able to find some of

this stuff useful in trying to identify areas spots for weather events. If we know weather is going to be bad, maybe we can institute some kind of emergency procedure. We'll try to get into some of these things in a minute for solutions to this stuff.

SLIDE 17: CLIMATE CHANGE AND VARIABILITY

I want to get into the climate change and variability. This issue, like I said, the science is based on the Intergovernmental Panel Climate Change and then kind of a U.S. science group called the U.S. Climate Change Science Program.

One question just popped up here: "Do the results ever lead to roadwork?" These results have never been published. In fact, I am still working out some of the editorial stuff on the document itself, but we should have it up on our Website soon. As far as trucks go—now Federal Highways, some folks, if you're familiar with this stuff, Paul Pisano works on that in the Federal Highway Administration for roadways. He may be able to answer that more, does this lead to roadwork and in specific roadways. I imagine it probably does. This is really specifically looking at the big trucks and buses issue and what we can do as a safety Agency to try to influence that issue.

Getting back to the climate change stuff, most scientists agree climate change is a result of human activities. We're burning coal and oil, and releasing stored carbon into the atmosphere, and we are changing the chemical composition of our atmosphere. Global CO2 emissions have been increasing extremely rapidly, much more rapidly than we have been able to find in the paleoclimatic data on the planet. That just basically means we can look climate history on a planet through rock formation and air bubbles, and we've never seen it increase this quickly before. It is extremely quick, and that's because we are releasing stored carbon into the atmosphere. Global temperatures are increasing, and we have more extreme temperature events—they're occurring more frequently. One of the big things I am concerned about with this particular issue is heavy precipitation events are increasing over most land areas. What happens is when the atmosphere is warmer, it can hold more moisture, so you can have heavier storm events. Sea level is increasing, and for our long-term infrastructure, our transportation, there are a number of studies going on with the U.S. Department of Transportation—some of them published and some of them are still going on—about the threats to our coastal infrastructure in particular and what we're going to do about this particular issue. We're really kind of limited as to what we can do in Federal Motor Carrier [Safety Administration] and how we are going to respond to some of these issues in affecting how we do our safety mission. We're really looking at some of the more immediate stuff and we can get into this here.

SLIDE 18: IMPACTS TO NORTH AMERICA

A new report was released by the USCCSP, they've actually changed their name, I think, to U.S. Global Change Research Program. They put out a report in June, this past June, called *The Global Climate Change Impacts in the United States*. They are looking at what can we measure going on in United States.

We are finding that in the western mountains we see warming that decreases the snowpack. We have more winter flooding, reduced summer flow. There's not a lot of barge traffic out in some of those. That might have some impacts as far as—maybe we can benefit if there's not as much snow because we get less crashes from that. I don't know. We see an increase in heat waves, in the durations, and intensities of these things that lead to driver comfort, idling to keep the air conditioning running, sensitive cargoes such as hazmat and livestock or agricultural products.

This Gulf Coast Study that's one of the reports that the U.S. Department of Transportation released. It's showing—it's looking basically at the Gulf Coast Region of the United States, identified lots of areas that are risks from not only subsidence that occurs in that area, sea-level rise and hurricane intensity. We have a lot of transportation infrastructure there, a lot of freight cargo coming in to the Gulf of Mexico, in particular bulk shipments of oil and gas.

We see cold season storms are shifting northward and the strongest storms are likely to become stronger and more frequent. That's really—I hone in on that because these kind of big events where you are driving along and you get this deluge, everyone's probably driven in one of those where your visibility is reduced very quickly. These things happen extremely fast. Some people are moving on the roads, some people are pulled over and it's just a recipe for an accident.

SLIDE 19: CHANGES IN SNOWFALL CONTRIBUTIONS TO WINTERTIME PRECIPITATION 1949 TO 2005

If we look at some of this report that I just mentioned, which actually hasn't been incorporated into the report that I have done yet, but I think that I should add some of this stuff in.

Changes in snowfall contributions to wintertime precipitation—some winners and losers, in some areas you reduce the snowfall and in some areas it's increasing. Because of these changes, I think we need to be aware of how these changes might affect drivers' ability to operate safely. Maybe we get some benefits, maybe we don't. Maybe areas that experience snow start experiencing more ice and ice is a bigger problem than snow.

SLIDE 20: INCREASES IN THE NUMBER OF DAYS WITH VERY HEAVY PRECIPITATION (1958 TO 2007)

This is a good graphic here. This is the number of days with very heavy precipitation from [19]58-2007. You can see, in the Northeast, we have had an increase of 58 percent of the number of days with very heavy precipitation. This is something that is happening across the United States. Even with the drought that we have in the Southwest for the last while, you are getting less frequent, but more intense storm events. So this has an impact on people's ability to drive safely when you these kind of deluges.

SLIDE 21: IMPLICATIONS FOR CMVS

What does this mean for CMV safety? What does this mean for Federal Motor Carrier [Safety Administration] and everybody out in the audience today that's concerned about this issue?

Safety looks like it is affected by severe and abrupt weather events and that could increase our crash risk. I think that's one of things I'm concerned about with this. In a mobility infrastructure situation, shipping patterns and methods from flooding and drought, changes in agriculture if we stop producing agriculture—these long-term things that could impact how we're shipping and where we are shipping to. There's trends that we might want to be aware of in the industry.

Another kind of big area is what are we going to do to mitigate or prevent climate change? What policies are coming down from Congress or this new Administration that wants to prevent CO2 emissions or reduce the C02 emissions? EPA is going to be looking at CO2 as a pollutant. How does that impact policies surrounding trucks and transportation and our ability to have mobility on the roads with safety? Are any of these programs contrary to our safety mission? These are things we need to look at—things that I'm trying to look at and get a handle on.

We could have a little bit of an uptick or reduction in snow-related crashes, but maybe the ice offsets those crashes or maybe the larger snow events that do occur exacerbate that.

Climate change will produce economic gains and losses, but right now, they are showing the losses far exceed the gains that we might get. This impacts on the damage or changes to transportation infrastructure. This impacts anything from if we're going to use more bio-fuels or the plants where these bio-fuels are produced—do they have adequate roadways for trucks to get in and out of them for ethanol transportation. Do we want to invest in large-scale IT operations in an area that might be inundated in 30 years? When we start building our transportation infrastructure, we want it to last for 50 years. We need to be looking at planning today for these changes that might happen tomorrow, and that includes truck and truck safety issues.

SLIDE 22: PLANNING FOR CLIMATE CHANGE IMPACTS AND CMV SAFETY

Getting into planning for some of the climate change issues and how this might affect the weather event—I'm really more focused, in this report, on the weather aspects of this, on the fog and on the left-hand side of the chart here. On the left, these are the more immediate events. We have increased tornadoes—how does that affect our transportation. Flash floods, fog, wet pavement events, thunderstorms these happen within minutes or hours, and are a little bit more of a headache. As we move over to the right of this graph, on the top here, as you can see, at the far end, sea-level rise—as far as CMV safety goes, sea-level rise is fairly long-term. It might be four or five decades before we have to worry about major problems for that. My area of focus is more on the left-hand side and trying to prevent weather-related accidents from occurring or increasing because we have bizarre weather, strange weather, or more severe weather that might be influencing the ability to drive safely. Down on the bottom, you can see, on the time-frame we're looking at how you deal with like planning infrastructure management, or rules and regulations might have a shorter time period, whereas capital investment of forward-facing infrastructure last for a much longer time period—so that factors into our planning.

SLIDE 23: CONCLUSIONS

In conclusion, for this report—and this report is really just kind of a first step in exploration into weather and some of the impacts on CMV and how weather might be changing and what the

trends are in weather, and that's why we get in to this climate change stuff. What we've seen is weather influences safety and mobility in CMV operations. We really want to start drilling down to figure out how and where.

Fatal weather-related crashes have been declining generally from [19]75, but recently have been leveling off. I would like to see that number continue to decline.

Potential for climate change impacts CMV safety and operations exists. Right now, I have kind of a follow-up study looking at how climate change policies and climate change impacts might affect CMV operations and FMCSA's ability to reduce crashes.

Obviously, further research areas include really getting a more robust GIS mapping of crashes and weathers. We can really get down on some of this corridor analysis that we are doing. That type of stuff, I think, it could really be useful, especially for the state folks who are trying tackle particular problem areas in their states. It might be able to identify this in trying to reduce crashes on particular roadway if they know that there are a lot of weather-related events, the same type of weather-related events—they probably know that already, but the data helps in making their case for increased funding or attention on a particular section. And then, also developing the appropriate responses, is it technology? Is it driver training? Is it equipment upgrades? I think, probably all three will be helpful, but maybe we want to specify what those are depending on what the challenge is.

We need to further investigate the impact of what this whole climate change issue is going to be on CMV safety and operations. I've kind of started some of that stuff to give us a jump on what might be coming down the pike in this new Administration.

I've got a question here—"When can we expect this particular report? When will it show up on FMCSA?" I am in the final revisions and edits of the report and I am hoping to have this out in the next month. We'll have it up on our Website—on the Analysis, Research, and Technology Division Website under the FMCSA Website page.

SLIDE 24: CONTACT INFORMATION

This is my contact information. Certainly, feel free if you want to try to get a copy of this report and you haven't seen it.

[31:20]

QUESTIONS AND ANSWERS

Michael Johnsen: It's time for some questions and I have been trying to answer the ones that have been com in. I'll take a couple here that I see just popped up.

Steve Gaddy: ***Various studies show a number of different climate-change scenarios in which climate changes may be manifested. Are the plans to look at different climate-change scenarios?***

Michael Johnsen: I am using the most reliable scientific data that we have on the planet on this stuff—thousands of scientists, the highest tech computers and equipment are running these models. The stuff that I'm looking at and the scientists that have been talking with—this is what I am trying to base this on and the U.S. Department of Transportation has very strict guidelines about what we rely on our research on this issue and this is standardized throughout the agency, so I am looking at these IPCC scenarios. Even their most aggressive scenarios are being exceeded as far as the amount of CO2 we are emitting and rapid rate of changes that we're witnessing.

Kirse Kelly: We do have some more questions. This is Kirse Kelly again. I want to let you know that any further questions you might have, you can continue to submit them online, or you can, if you want to ask questions over the phone, like it says, you can just dial ***1** to ask those questions.

Just a reminder that you will be given an opportunity to download a copy of the presentation at the end of the webinar. If you have to leave early, you can return to this Website or the FMCSA Office of Analysis, Research, and Technology Website at a later time and the slides will be available.

One other item, I know it went away pretty quickly, but Mike's contact information—we'll go ahead and put that up again later for you to take a look at.

Virginia Spence: ***Is there funding already allocated to FMCSA study in order to study it's conclusions?***

Michael Johnsen: Some of it and some of it no. Some of it, I think I need to sit down and try to map out how we're going to approach some of this stuff. I want to do more investigation to make sure we utilize resources in the most efficient way possible. I think this is going to be an area that we want to look at. Obviously, weather is not the largest contributor of crashes, but it's really how we behave and weather influences how we're going to behave, so that is really important.

Fred Klein: ***On the slide of rain changes, in percentages, are there data by state?***

Michael Johnsen: I think I can break this down by state, but I will kind of have to check out some of the databases here. We certainly can locate where all of the fatal crashes are, so we know where they are in each state. I think that's one of the things that I am going to help out with and FMCSA's contacts to states to try to provide some of this data applying to specific states.

Julie Ann, are there any questions over the phone?

Julie Ann (Operator): Yes, thank you. I do have one question in queue and at this time if others would like to ask a question, press ***1** on your touch-tone phone. Our first question comes from Paul Pisano, your line's open sir.

Paul Pisano: ***The crashes themselves, are they mostly single-vehicle crashes or multi-vehicle crashes, or are you looking at interactions with other vehicles as part of these crashes?***

Michael Johnsen: We strictly did it by fatal crashes and then obviously, that information's in that FARS database. That might be an excellent way to kind of tease that out because if we are having vehicle-on-vehicle crashes and that is one thing. If these are individual vehicles going off the roadside, that is another way of how we'd approach it. We can slice the information that way. On this report we kept it have at a high level, but that's an excellent area to drill down in. I think we will be having some conversations in the future about this because you guys have some great insights on how we could combine some resources and look at this in the big picture on the department-wide level. I appreciate you tuning in and checking this out. That's a great point—trying to determine what some of the more details are with specific crashes that are happening especially on the commercial-vehicle side.

Paul Pisano: ***You are trying to get some sense of exposure by looking at the annuals, and I think that is helpful as a place to start. And we on the road-weather side have not dug into the exposure side of it at all, but we've wanted to. I am wondering if you have any plans because the question comes up maybe more crashes happen along these routes, but how often are there adverse weather conditions on that route? Clearly, you need to get a little bit more that just annually to get a better sense of that and I'm wondering if you thought about exploring that a little further as well?***

Michael Johnsen: Here's my awesome idea using super-high technology. If you could place the time of the crash as well, you could have historic weather pattern data showing the storm move across the state, for example, and in real-time show when that crash occurred. So you could actually see if it is occurring because of a particular weather storm or not. That may be impossible to do based on limitations of knowing when the crash actually occurs, but things like that, I think that's exactly what I am trying to do is find out what is the interaction with the weather and these particular crashes for these are coded into. And right now, we have kind of the blunt tool of the FARS data and how they code the weather event, but in that study might be better as far as taking a particular area and monitoring it and looking at particular crashes—maybe some type of large truck crash causation analysis specifically on weather might be helpful. These are all, obviously, limited by our resources and what we have. I think that these are conversations that I want to have based on getting this type of a document out there. It's exactly where I want to try to go in trying to form ideas and questions about how we address this issue. Since FMCSA's never really dove into the weather in the commercial vehicle area before, I want to

lay out a general broad path that opened up a lot of doors and raises questions and perhaps answers. Exposure is a big deal, and how these crashes are interacting with weather. Another excellent point, Paul.

Guest: ***What portion of the weather fatalities might be avoidable? When do you plan to assess the mechanism to reduce fatalities?***

Michael Johnsen: Excellent question. You are getting right to the core of what we are trying to do here. Can we prevent these things? Is driving in severe weather hazardous and just part of the job? Can we use technologies? Can we use better driver training? If our weather is changing and we have more severe events, perhaps we need to focus more on the fact that this stuff is happening a lot and be prepared that this may be more frequent than you might think. That is exactly what we are trying to do.

Mouyid Islam: ***Are snow and fog affected fatality crashes in Indiana?***

Michael Johnsen: I think there's a few. I would have to go back and look at a closer may and look at that particular analysis for Indiana. The hot-spots were not in Indiana though, but I think there were a few that were in Indiana.

Guest: ***Does your data allow you to separate weather as a causal factor versus some of the other factors with a weather event?***

Michael Johnsen: Not really, because right now, with the FARS data it codes that these weather conditions were present and it's pretty broad, but that's a place to start. With the Large Truck Crash Causation Study, that was focused in on a set of particular crashes that they asked a lot of information on. However, in that particular study the highlight was not looking at weather events. I think you kind of need to ask different questions to kind of tease that out. If the driver was driving too fast for conditions, was that because the conditions were icy and those kinds of questions. So it really has a lot to do with coding and how they are trying to pull out the information. That would be in excellent area to look at.

Kevin Petty: ***It would be good to know the number of fatalities associated with these accidents. Do you have those numbers?***

Michael Johnsen: That should be in the final report. We have to counts and stuff and we are trying to map these out.

Michael Johnsen: Any questions on the phone, Julie Ann?

Julie Ann (Operator): No questions at this time, sir.

Michael Johnsen: If anybody has any last questions, then we can take those now; otherwise, we can get out of here a little bit early. I want to thank you guys for tuning in on

this webinar. Certainly get in touch with me if you have further questions. I think you will be seeing this report in the next few weeks on our Website.

[40:57]

Kirse Kelly: This is Kirse Kelly again and that concludes the presentation part of our webinar. Before you sign off, please complete the evaluation that you see on the screen. We welcome your comments about the webinar and your suggestions for future Webinars. Your comments will be viewed by other participants in the meeting room unless, if you would like to remain anonymous, you can click on **Everyone** at the bottom of that suggestions pod, and just chose **FMCSA Host** or **Presenters** and it will not show up to anyone else.

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As a reminder, members of the trade or local media participating in today's webinar should contact the FMCSA Office of Communications, and that number is (202)366-9999. Contact that number if you have any questions. Once again, (202)366-9999.

In two weeks, on July 22, we will host a webinar about "Evaluating the Safety Benefits of a Low-Cost Driver Behavior Management System," and registration is already open, so you can go to our Website that you see on the screen to register today. We will also be sending out announcements for this and other webinars, so if you are not on our e-mail list, please contact me and request your name be added to that list. I will go ahead and put my e-mail up in just a moment.

That concludes this webinar. Once again, thanks all of you for participating and thank you also to Julie Ann, our phone operator.

[43:06]