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OFFICE OF ANALYSIS, RESEARCH, AND TECHNOLOGY

Evaluating the Safety Benefits of a Low Cost Driver Behavior Management System

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Webinar Transcript

Presenters

- Dr. Jeffrey Hickman, Virginia Tech Transportation Institute

Other Speakers (in order of appearance)

- Kirse Kelly, Web Conference Host, FMCSA ART
- Olu Ajayi, Mathematical Statistician, FMCSA Office of Analysis, Research, and Technology (ART)

Description:

FMCSA's Research Division sponsored a study to evaluate the safety benefits of a low-cost driver behavior management system (DBMS) called DriveCam. The objective of this research was to provide an independent evaluation of the safety benefits of a commercially available low-cost DBMS in commercial motor vehicle operations. The DriveCam System integrates in-vehicle video, driving performance management software, and driver counseling to reduce poor driving and its resulting impacts and costs. This recently-completed study was conducted by the Virginia Tech Transportation Institute (VTTI). It involved two commercial vehicle carriers, one local/short haul and one long-haul operation and a total of 100 large trucks. Jeff Hickman, the research coordinator at VTTI for this study, will present the findings from it in this webinar. The results demonstrate that the DBMS, DriveCam, significantly reduced the mean rate of safety-related events per 10,000 miles traveled.

PRESENTATION—EVALUATING THE SAFETY BENEFITS OF A LOW COST DRIVER BEHAVIOR MANAGEMENT SYSTEM IN COMMERCIAL VEHICLE OPERATIONS

PRESENTATION TITLE SLIDE: EVALUATING THE SAFETY BENEFITS OF A LOW COST DRIVER BEHAVIOR MANAGEMENT SYSTEM IN COMMERCIAL VEHICLE OPERATIONS

Angela (Operator):

Welcome and thank you for standing by. At this time, all participants are in listen-only mode until the question and answer session of today's conference. At that time, you may press ***1** on your touch-tone phone to ask a question. I'd also like to inform all parties that today's call is being recorded. If you have any objections, you may disconnect at this time. I would now like to turn the call over to you web conference host, Ms. Kirse Kelly. Thank you ma'am, you may begin.

Kirse Kelly (Web Conference Host, FMCSA ART):

Thanks Angela, and thanks to all of you who are participating in our webinar today about *Evaluating the Safety Benefits of a Low Cost Driver Behavior Management System*. This webinar part of a series put on by the FMCSA Office of Analysis, Research and Technology.

As Angela mentioned, time permitting, all questions will be answered at the end of the call. You can submit questions in the **Q&A Box** which is here—let me show you—on the left side of your screen. You can do that throughout the presentation. At the end of the call, you will be able to both submit questions online and ask questions over the phone. Once again, we will be answering those questions at the end of the call.

Members of the trade or local media are asked to contact our Office of Communications at (202) 366-9999 at the conclusion of the webinar if you have any questions. So, once again, that's the Office of Communications, that phone number there, online for you.

Finally, for anyone who may have a smaller screen and the virtual meeting room is just on the upper left-side of your screen, you should be able to take care of that by going up to **Meeting**, choosing **Manage My Settings** and then chose **Full Screen**.

Now, let me go ahead and turn you over to your web conference host, Olu Ajayi, who is the Mathematical Statistician in the Research Division here at FMCSA.

Olu Ajayi (Mathematical Statistician, FMCSA ART):

Hi, everybody, and welcome to this afternoon's webinar. Today we're looking at The Evaluation of Safety Benefits of a Low Cost Driver Behavior Management System in CMV Operations. This is a study sponsored by the Research Division of FMCSA and here at the Research Division, we are interested in human factors and driver-related factors in crashes. We are pretty much aware of the statistics and the role they play. More importantly, we're interested in the role

of technologies—simple, complex, innovative new ones and how they can help us impact and mitigate these negative impacts.

Today, we have Jeff Hickman, Dr. Jeff Hickman from VTTI. He'll be presenting the findings of this study and go into detail about what the DBMS is, what the system is made up of, the methodology, the data, the findings and recommendations. So, sit tight and have a good time. Jeff?

Dr. Jeffrey Hickman (Group Leader, Behavioral Analysis and Applications, Virginia Tech Transportation Institute):

Thanks Olu. I appreciate that. I just want to indicate I don't have any control over the presentation at this moment; I can't forward the presentation slides from my computer.

Kirse Kelly:

Okay, you should be able to do that now Jeff.

Dr. Jeffrey Hickman:

All right, I will wait until this takes place.

Kirse Kelly:

One moment.

Dr. Jeffrey Hickman:

First of all, I'll thank everybody for joining me today, especially those on the East Coast, because I know you're giving up your valuable lunchtime.

All right, here we go.

SLIDE 2: ACKNOWLEDGEMENTS

I also want to take the time to thank Dr. Martin Walker and Olu Ajayi for their input on several revisions of the final report, and also the trucking fleets and drivers who participated in the pilot test. They'll remain anonymous. I also want to thank Del Lisk of DriveCam, and Alan Mann, formerly of Drive Cam, for collaborating on this project.

SLIDE 3: PROJECT OBJECTIVES

The objectives of this project really were to assess the driving behavior management system. These systems are becoming more prevalent. A lot of companies are making claims to the safety benefits of these devices. Given these kind of safety issues, FMCSA contracted VTTI to provide an independent evaluation of a commercially available low-cost driver behavior management system. When I say that, that's a type of system that really incorporates some type of in-vehicle

video technology, has performance management software where someone can actually watch the video from a remote site, and some driver counseling program.

SLIDE 4: INTRODUCTION

Crashes involving large trucks constitute a significant safety risk. Given the audience of this presentation, it's probably not very surprising. Studies have shown that it's really driver behaviors that are a contributing factor in these crashes. These can be decision errors, recognition errors, performance errors, or non-performance errors.

SLIDE 5: LEADING VERSUS TRAILING INDICATORS

Really when you are talking about safety, most safety managers focus on these trailing indicators—kind of like the things they can see.

If you look at the diagram, it's really a pyramid over the shape of an iceberg. Basically, you see at the top is a fatal crash, followed by a serious injury-crash, a minor crash, a near miss, and at-risk driving behaviors. So basically, you say, for so many at-risk driving behaviors there's one near miss, for so many near misses there's a minor crash—really the point is we're really focused on the things that we can see, but when we focus on the things that we can see, it's too late. So, if I want to prevent the fatal crash, but I wait for the fatal crash to happens, it's too late for me to prevent that crash. If we know that at-risk diving behaviors are really the reason for these crashes, we really should focus on these at-risk driving behaviors so we can prevent the crash from occurring.

SLIDE 6: BEHAVIORAL APPROACHES

The behavior approaches to reducing problem behavior have a proven track record. However, all prior work has occurred in settings where employees can be directly observed, so you have a worker observe another co-worker, and basically, he'll give him feedback—he or she feedback—on their safe and at-risk driving behaviors. This is really difficult with truck drivers because they are lone workers; they really have limited accountability; there're out there by themselves. If you have a ride-along, you've really got to talk about the accuracy of the ride-along—you're having somebody drive with this other driver and they may react to that and perform more safe than they would normally. If you're doing a spot-check, this could be dangerous to do a spot-check wrong in a heavy vehicle. So, we are really missing an objective or a reliable way to observe driver behavior.

SLIDE 7: DRIVING BEHAVIOR MANAGEMENT SYSTEMS

But, now we have these new technologies that provide objective measures of driver behavior. We get continuous measures of driver behavior/performance. We especially get in-vehicle video technology and these can be used to provide feedback to drivers and identify risky drivers. I want to stress technology alone is insufficient to alter driver behavior. These systems are really meant

to collect the data, whereas the behavioral-safety techniques are really going to drive the behavior change. It's really the combination of the technology and the behavioral safety techniques that are a powerful approach that's reducing at-risk behaviors and their associated crashes and injuries.

SLIDE 8: SOLE SOURCE NOTICE

Prior to the study, we posted—VTTI, Virginia Tech Transportation Institute posted—a Sole Source Notice on our Website. This is really to request responses from interested technology vendors. They really had to have these three components of the driver behavior management system: they had to have the video, they had to have the software where safety managers or other people could view the data, and they had to have some sort of counseling program. They also had to donate the equipment and personnel. It had to be low-cost and already commercially available. They had to have two fleets on board—50 drivers each for what we would call the pilot test. One of those fleets was a long-haul fleet and the other was a short haul fleet. DriveCam was selected as the technology vendor.

SLIDE 9: DRIVECAM EVENT RECORDER

As you can see, right here, in the right-hand corner, is the actual DriveCam event recorder. On the left-hand, you can actually see the device. On the right-hand, you can actually see the device in a passenger car where it is mounted behind the center mirror. Basically, when that recorder was placed in the truck's windshield, it had two cameras: a driver's face camera, and a forward view looking out the forward windshield. It had three accelerometers and it was recording in a constant loop. So, it was constantly recording, however it was only saving data once the criterion of .5 g's was network seeded. Once the criterion hit, it essentially saved eight seconds before that criterion and four seconds after, so you have 12 seconds of video. There's a light in the event recorder that basically would blink, giving the driver immediate feedback that an event has been stored.

SLIDE 10: VIDEO EXAMPLES

Now I'm going to show you a video example of some of the data that was actually recorded in the study. You'll notice there's two video screens. On the left will be the forward facing view, and on the right will be the driver face camera. We blurred the driver's face to protect their anonymity. This is company owned data so, we didn't have permission from the driver. We didn't need it, but we still wanted to protect their anonymity given what's going on in some of these videos.

In this particular video, we have a driver that gets in their truck, gets in a full stop, doesn't buckle up, and really does an improper job of scanning and almost "t-bones" the van right there. We'll play that one more time. This individual just really doesn't scan right and left when he gets in the truck and just pulls out. We'll play it one more time. Again, this is the richness of the data. You're not going to get this data. This is a near crash. You would have no idea this happened. With this type of technology, you would not only know what happened, but you know why it

happened because you have the video. Now we can see this person wasn't scanning. You can bring this driver back in, show him the video, because video does not lie. Then you can think of ways to kind of reduce this behavior from occurring again. It's very powerful—again, this is data you would not have—it's not a crash.

We'll show another video example, again it's collected from the study. Again, the driver's face is going to be blurred. In this particular instance, the driver face camera was blocked, but you can see this driver makes a left-hand turn and essentially hits the median. That's a minor crash, but again, it there wasn't any type of significant damage, you probably wouldn't know about it. The driver could hide it if there wasn't any damage. Now that you have this technology, you know what happened, and you could bring the driver in and say, "Hey, what was going on here? Obviously, you made the turn and went right over the median. Were you distracted? What was going on?" You have that rich data that you didn't have before. It's really detailed information on the pre-event behaviors on what is going on with the video technology.

I'll show you one last video. Cell phones are a big issue these days. This individual is talking on a cell phone, which you cannot see and he's making a right-hand turn to merge into traffic. He's talking on the phone, and he thinks it is okay to go—probably not paying as much attention as he could because he's on the phone—and he almost gets in a crash. He almost got stopped real hard and you can see a pickup truck there go right in front of him, and he actually says, "I will call you right back." He actually hangs up the phone right there. We'll play it one more time. He seems like he's paying attention, he's looking, but he's also on the phone and thinks it is okay to go, and he has a hard brake— and luckily he did, because he would have gotten in a collision with the pickup truck. Again, you wouldn't have that data if you didn't have the video. You have this detailed information and that's possible because we have this video data. So you can get this idea, really, what's going on in your fleet because there may be drivers not getting in crashes, but they're doing a lot of things that are at-risk and you wouldn't know that. Again, you're focusing on trailing indicators, but with this device you have the leading indicators.

I think that's it for the videos.

Kirse Kelly:

Let's play that video one more time—people are saying it is taking a little longer.

Dr. Jeffrey Hickman:

Again, you can bring this driver in, show him the video, kind of reaffirm your company's cell phone policy and hopefully that's enough to prevent this behavior from occurring again. However, if it's frequent behavior, maybe you need disciplinary action.

SLIDE 11: DATA REDUCTION

As far as data reduction, essentially, once these events were stored on the event recorder, they were sent each day, via cellular transmission to DriveCam headquarters. Essentially, a person watched all these videos to really determine the validity of the event. So, basically, was it valid event or was it spurious trigger—watch the event, maybe it got triggered because they went over

railroad tracks, or a pothole, or maybe it's a real safety event. If it's one of these spurious events, basically they didn't look at it any further. If it's a safety-related event, they watched it and they basically reduced the event and that's recording the trigger, the root cause kind of behaviors going on, a narrative and an Event Score. Essentially, if there was a collision or the Event Score is pretty much greater than or equal to five, then the manager will basically send an email saying, "You should review this event. This is something you really want to see."

You see this flowchart on the bottom of the presentation here. Essentially, an event was captured, the data was transmitted via cellular service, then the videos were reviewed by a human being—basically, the validity was determined. Was it a safety-related event or was it not? If it is not, basically the video is essentially deleted. If it is, then it gets reduced and they watch it and record what's going on with the event. It's uploaded to a server and we or the safety manager can access the event.

SLIDE 12: HINDSIGHT SOFTWARE

Here's an example—so, when you log on with your password, essentially what you're going to see right here, over on the left, you can see the data reduction, you can see there's basically root causes, risky behaviors, and a narrative, and you can also watch the video. So, when you log on, there is a list of events; you click one of the events and it brings you to this page. There's also you can list comments on what is going on—make a comment that you coached the driver or some other comment.

SLIDE 13: COACHING PROCESS

The coaching process—essentially, the managers are instructed to review the event prior to the driver coming in. Then the driver and safety manager watch the event and the manager will explain it and the viewpoint and really pinpoint the root cause. It's supposed to be kept positive. It's supposed to be a positive experience, something about the manager saying, "I care about your safety and I want it to improve because I don't want you to get in a crash." Then they determine follow-up steps. It could be training, discipline, or reward. It wasn't supposed to be just all at-risk events. Maybe the driver reacted positively or correctly in the event. They were supposed to be brought in to show this is the right way to do things. Then they would resolve the event in the software, indicating the coaching had occurred, and they would list notes.

SLIDE 14: RESEARCH DESIGN

The design for this particular experiment was an $A^4 B^{13}$ reversal design. It was a quasi-experiment. When I say "quasi," it just means the participants in the experiment were randomly assigned. Basically, there were 50 participants that were selected by safety managers.

The four over here indicates how many weeks they were in baseline, or in intervention. A^4 would be four-week baseline phase. During that four-week baseline phase, the vehicle was instrumented with an event recorder, and drivers drove their normal revenue-producing deliveries. However, managers didn't have access to recorded data—although VTTI did—and no

coaching occurred and the feedback light was deactivated. So, they weren't getting that immediate feedback on the event. Essentially, they were just doing their deliveries and the event recorder was recording events.

The 13-week intervention phase was really identical to the baseline phase, but the managers had access to the recorded data. So, now they had access to data; however, they didn't have access to the baseline data. They just had access to the intervention data, so they couldn't go back and see what drivers were doing during the baseline phase. They coached when necessary, and the drivers received immediate feedback via the feedback light. It would blink when an event was stored.

SLIDE 15: PARTICIPANTS AND SETTING

Participants—we had two carriers. Again, they'll remain anonymous. The first carrier was a long-haul carrier in the Southeastern U.S. that delivered dried goods. Fifty drivers had an event recorder installed and 36 drivers completed data collection. Also, 46 drivers signed what we called an Informed Consent Form, and that allowed VTTI to contact these drivers with questionnaires.

Carrier B was a local short-haul carrier in the Pacific Northwest. They deliver beverage and paper goods. Again, 50 drivers had an event recorder installed. Forty-one drivers completed data collection and 30 drivers signed an Informed Consent Form.

I just want to say that both of these carriers are very safety conscious. They have similar safety cultures. Their SafeStat scores were very good and very similar.

SLIDE 16: PROCEDURES (1)

The procedures—DriveCam was instructed to conduct business as usual. Prior to data collection, drivers and managers attended a project briefing. We went over the purpose of the study, the informed consent procedures and how the DriveCam technology worked. Then 50 trucks at each site had an event recorder installed. Once all 50 trucks had an event recorder the baseline phase started. Again, the event light was deactivated; there was no coaching; the safety managers did not have access to the events.

SLIDE 17: PROCEDURES (2)

Prior to the start of the intervention phase, managers participated in a separate training session, and they were instructed on how the DriveCam technology works. But they got to learn how this HindSight software works—how do you go into the software and look at the events/resolve events, and also instructions on how to coach drivers.

After the four-week baseline phase stopped, then the 13-week intervention phase began. The event light was activated, coaching occurred when necessary, and safety managers had access to the events. Also, drivers completed an in-study questionnaire.

Following the end of the intervention phase, we also gave drivers a post-study questionnaire and safety managers a post-study questionnaire and really determined their perception and opinions of the DriveCam safety. Due to the brevity of this talk, I'm not going to be going over that data, but you can find that in the final report. Let's get to the data.

SLIDE 18: HYPOTHESIS 1

The first hypothesis was: **There will be a significant reduction in the mean rate of safety-related events from baseline intervention.** The dependent variable was the mean rate of safety-related events per 10,000 miles, and all that is, is the frequency of safety-related events divided by the number of miles traveled. That's really important to have that denominator because we're normalizing the data so we can account for missing days, drop-outs and exposure. We used a paired-sample t-test to see if there's a significant difference between the baseline to intervention phase. When I say "significant"—we are basically looking at the means between the baseline to intervention phase. When you have a mean, you have some drivers that did better and some drivers that did below that mean. So, given the variability within those means, are those two means truly different? That's what this test tells us—if they're really different.

SLIDE 19: CARRIER A: RESULTS (1)

For Carrier A, as I said before, 36 drivers are included in the data analysis, 14 drivers quit, resigned, withdrew or had a malfunctioning event recorder, or they didn't meet minimum requirements to be included in data analyses. So, basically, a driver had to have at least three weeks of baseline and four weeks of intervention data to be included in the data analyses. We had some technical issues with this carrier: five drivers we had to just wipe out because we didn't have any baseline data on them. Obviously, we have to have some baseline data. However, an additional eight drivers we had some baseline data, but we were missing some data. So, when you're looking at this data, remember the baseline phase for Carrier A should be higher.

There were 58 safety-related events in the baseline phase. Two of them were collisions and 56 were these risky-driving events. That could be not wearing your safety belt, following too close—something of that nature. There were 141 safety-related events during the intervention phase—two collisions and 139 risky driving behaviors. Again, given the difference in the collection periods, you can't just look at these frequencies, you really have to turn it into a rate.

SLIDE 20: CARRIER A RESULTS (2)

Thirty-six drivers during the baseline phase drove almost 300,000 miles during that forward period and the mean rate of the safety-related events per 10,000 miles was a little less than two: 1.94 events per 10,000 miles. That means, for every 10,000 miles, there were approximately almost two events. These same 36 drivers drove almost 1.2 million miles during the intervention phase. The mean rate of safety-related events per 10,000 miles during the intervention phase was 1.2, so you see almost a 40% reduction. That paired sample t-test found that these two means are significantly different.

SLIDE 21: CARRIER A RESULTS (3)

Right now, I'm going to show you a figure. As you can see, right here, the baseline, 1.94 safety-related events per 10,000 miles, and we reduced this 38.1% significantly during intervention phase to 1.2 safety-related events per 10,000 miles. You can see a nice downward trend and it actually gets to zero in week 17. Again, remember, given that some of the eight drivers had missing events during this phase, this should likely be higher.

SLIDE 22: CARRIER B: RESULTS (1)

For Carrier B, 41 drivers were included in the data analysis; nine drivers were excluded for various reasons. There were 65 safety-related events during the baseline phase—one was a crash and the others were these 64 risky-driving events. There were 115 safety-related events in the intervention phase, two were collisions and 115 were risky-driving events.

SLIDE 23: CARRIER B: RESULTS (2)

These 41—remember these are short haul drivers, they didn't drive as much—they drove 160,000 miles during the baseline phase and during the baseline phase, the mean rate of safety-related events per 10,000 miles was a little over four.

These same 41 drivers drove a little over 600,000 miles during the intervention phase and the mean rate of safety-related events per 10,000 miles during the intervention phase was 1.93. You see over a 50 percent reduction, and that's a significant reduction right there.

SLIDE 24: CARRIER B RESULTS (3)

Here's the graph. As you can see, here's the mean. Essentially, for every 10,000 miles there were four events, and this is reduced over 50 percent in the intervention phase to 1.93. You can see a nice reduction, slight downward trend—very nice-looking data.

SLIDE 25: HYPOTHESIS 2

The second hypothesis—now we want to look at what we would call severe safety-related events. A severe event was any event with an event score greater than three. DriveCam did not score collisions for liability issues. They don't reduce them; they just send you a video and indicate that it happened. A three might be a driver unbelted, or a driver on a cell phone. An 11 in this study, which was the highest score we had, was a driver involved in a near crash while talking on a cell phone and unbelted. Essentially, a severe event was that more than one thing was going on—the driver was unbelted and he was on the cell phone, or the driver was following to close and he was unbelted. That was a severe event. Again, the dependent variable was the mean rate of these severe safety-related events per 10,000 miles. So, now we are just looking at the frequency of severe safety-related events and dividing by the miles traveled.

SLIDE 26: CARRIER A: RESULTS (1)

Carrier A there were only 16 severe safety-related events. That's 8.7 percent of the total number of safety-related events. That's baseline and intervention. If we just look at the baseline phase, the mean rate of severe safety-related events per 10,000 miles was .22, and this was reduced to.09 safety-related events per 10,000 miles, or severe safety-related events, in the intervention phase. We see almost a 60 percent reduction in these severe events. However, we were not able to show if this was statistically significant. We really just did not have statistical power. There were so few events, and we didn't have enough drivers. We did our power analysis and it said you need 30 drivers if you're going to show a difference between baseline and intervention. We didn't consider severe safety-related events; still, these are the events that you want to reduce, and we had an almost 60 percent reduction, so it really is a noteworthy reduction.

SLIDE 27: CARRIER A: RESULTS (2)

Here's the graph. As you can see, it's pretty choppy because it essentially either had one or two or three events, or you had none. You can see during the intervention phase, a downward trend. Again this is Carrier A, so this baseline is likely to be higher.

SLIDE 28: CARRIER B: RESULTS (1)

Now we're going to look at carrier B results. There were a total of 28 severe safety-related events. This was just over 15% of the total number of safety-related events. The mean rate of severe safety-related events at Carrier B during the baseline phase was .36. This was reduced to .2 severe safety-related events per 10,000 miles during the intervention phase—again, over a 40 percent reduction in the mean rate of severe safety-related events. However, again, we weren't able to show that the two numbers were significantly different—again, just a noteworthy reduction.

SLIDE 29: CARRIER B: RESULTS (2)

In this next slide I'm going to show you, is a graph of those results. You can see, right here, here's the mean rate. You can see we reduce it by over 40 percent; however, we have a slight upward trend during those last few weeks. I am unable to explain that, but nice reduction.

SLIDE 30: IN-STUDY DRIVER QUESTIONNAIRE (1)

The in-study driver questionnaire—this is a 10 item questionnaire to serve as a manipulation check on the coaching protocol. We wanted to see if safety managers were following the coaching protocol because we thought it was critical that safety managers follow the protocol—because this is really what's driving the behavior change. We would contact each driver after each coaching session. So, the safety manager would indicate in the Hindsight software whether a coaching session occurred. Once we saw the data, we would contact that driver if they signed an Informed Consent Form, and we would give them this questionnaire.

At Carrier A, there were a total of 32 coaching sessions. The average time between when the actual event occurred and when the coaching session happened was 5.8 days. That's pretty impressive because, remember, this is the long-haul carrier. We had probably expected it to be much longer. These individuals did a great job of rerouting drivers to get them back in there as soon as possible to do the coaching session. Twenty-five of the 32 coaching sessions were drivers that signed an Informed Consent Form; thus, we could contact them. Of those 25, 10 actually completed one. We only had a 40 percent response rate—a little low.

SLIDE 31: IN-STUDY DRIVER QUESTIONNAIRE (2)

At carrier B, there are total of 37 coaching sessions. The average time between the event and the coaching session was 10.1 days. Twenty-eight of the 37 coaching sessions involved a driver who gave us permission to send them a questionnaire and of those, 14 questionnaires were completed—50 percent.

SLIDE 32: IN-STUDY DRIVER QUESTIONNAIRE (3)

This table shows the data. As you can see, I have six items right here, on the far-left column. The middle column is Carrier A's results, and the far-right column is Carrier B's results. You can see, it's kind of a tale of two safety measures, I guess you could say.

If you look at the first question, reviewed video during the coaching session, this is what they're supposed to do during a coaching session. You see 80 percent of the drivers said, yeah we did that at Carrier A, only seven percent at Carrier B.

How clearly was the root cause identified? Again, very important to identify and pinpoint what's going on in the video. This is on a nine-point scale. Drivers at Carrier A said, "Hey, 7.1, this is a really clear—the safety manager told me what was going on"—as opposed to Carrier B: it was 1.0, very unclear. You can see when you compare these two columns, Carrier A, very positive, it was kept positive, whereas, Carrier B was not exactly following the coaching protocol.

What this data suggests is Carrier A adhered to the coaching protocol, while Carrier B did not. Now, this kind of, really is the difference on safety climate, I guess you could say. At Carrier A, we had safety manager who had been there for many years. The drivers trusted this individual. She had great rapport with the drivers, and essentially, the drivers said, "Hey, let's try this out." The rollout was a very smooth. As opposed to Carrier B—this safety manager was very new. He was really put in a tough spot. You've got a safety manager who has only been there a couple months and is asking the drivers to put a video camera in their truck. He really didn't have the trust level or the rapport of the safety manager at Carrier A, so this person was really in a tough spot. Also, the rollout wasn't as smooth as possible. We had the initial rollout to explain what was going on and it was pretty poorly attended. I should have stayed for several more days to really tell drivers exactly what was going on. Really, misconceptions were rampant at this carrier. I actually had to fly back and meet with drivers one-on-one, and tell them exactly what's going on with this study.

You also might be asking yourself, "Carrier B drivers' safety managers—they didn't follow the coaching protocol, but they had this 50 percent reduction. Why?" When we talked to drivers, they told us they would all get feedback. So, essentially, there was a dispatching device and they would get a message saying, "Follow the company's policies on safety-belt use," or "Follow the company's policies on not talking on your cell phone" with drivers. So essentially, all drivers were getting feedback, not just drivers who had a coaching session. That's why we think we saw the change.

SLIDE 33: POST-HOC ANALYSES (1)

We really wanted to show that—"Is watching the video really driving behavior change? Is it really important?" We did some additional analyses on data from Carrier A because we could actually tell at Carrier A which drivers had a coaching session where they watched the video and which didn't. We wanted to assess the impact of the coaching session. We divided the drivers at Carrier A into one of two groups—a fleet manager coaching group, drivers that participated in a coaching session where a video was reviewed—and this is 13 drivers—13 drivers where they had a coaching session and they watched a video. A driver may have participated in more than one coaching session, but there were 13 drivers that viewed a video at one or more coaching sessions. This other group—the no fleet manager-coaching—were drivers who did not participate in a coaching session where a video was reviewed, or did not participate in a coaching session of any kind. So essentially, these guys did not see any videos. These are 23 drivers. Again, we didn't do this with Carrier B because we couldn't tell the difference between drivers that watched a video and drivers that didn't.

SLIDE 34: POST-HOC ANALYSES (2)

We are going to look at those dependent variables again. First, we're looking at the mean rate of safety-related events per 10,000 miles in the fleet manager-coaching group. Again, during the baseline phase, the mean rate of safety-related events per 10,000 miles in this group of drivers that actually saw videos is 1.65. This was reduced to .95 in the intervention phase. We had a significant reduction, a 40 percent reduction from baseline to intervention, and a mean rate of safety-related events per 10,000 miles.

However, if we look at the no-fleet manager-coaching group—this is the group that didn't see any videos—the baseline was 2.11 mean safety-related events per 10,000 miles at baseline and intervention was 1.39 safety-related events per 10,000 miles. Again, we have a 34 percent reduction; however, this was not significant.

SLIDE 35: POST-HOC ANALYSES (3)

As you see in this bar chart, the blue was the baseline phase and red is the intervention phase. You see the first significant reduction, again at over 40 percent, right here. With the group of drivers that didn't watch any videos, again, we have almost a 40 percent reduction, but not significant—still a reduction, but not significant.

Again, I actually want to go back to this phase for a little bit. You might be saying to yourself, "Look at this group of drivers at baseline is higher than this group. These guys are more risky. How come these guys aren't being focused on more? Whereas, these guys are watching the videos. The guys watching videos are the guys that are really in need of coaching. Whereas, These guys didn't see a video, yet, it looks like they're being riskier." This next data is really going to show you what's really going on.

SLIDE 36: POST-HOC ANALYSES (4)

If we looked at the severe safety-related events, we can really paint a picture on why those drivers were receiving a coaching session with a video. So, if we look at that group of drives that saw video, the mean rate of these severe events was .53 during the baseline phase and that was reduced over 75 percent to .13—that's the mean rate of severe safety-related events per 10,000 miles. Unfortunately, this wasn't significant—again, given the limited power that we had—but we still have a 75 percent reduction.

SLIDE 37: POST-HOC ANALYSES (5)

You can see with the no-fleet manager-coaching group, there's essentially no change. In baseline, the mean rate of severe safety-related events was .05, and during intervention was .07. This really illustrates what's going on right here. Again, the blue is the baseline, the red is the intervention; again, these are the drivers getting the coaching session, and they need it. They're the ones poor performing in all these severe safety-related events. The drivers that should be getting the coaching sessions and watching the videos are getting them, and they reduced their behavior by 75 percent.

SLIDE 38: POST-HOC ANALYSES (6)

So, we were able to show the power of the videos in reducing safety-related events; however, the limited power restricted our ability to detect a significant difference when we were talking about severe events. Those drivers involved had higher severity safety-related events—thus, in need of a coaching session—did receive a coaching session, which is good. So, that basically shows the drivers that were doing the most at-risk things, the most severe things—those were drivers that were being intervened upon correctly by watching the video, and we see this 75 percent reduction in those severe events in the group of drivers that saw video.

SLIDE 39: SUMMARY

Let's try to wrap it all up. What does it all mean? This experiment shows the effectiveness of a driving behavior management system to decrease risky-driving behaviors in both local short-haul drivers and long-haul drivers. The first hypothesis, which was a significant reduction in the mean rate of safety-related events, was supported. However, the second hypothesis, a significant reduction in the mean rate of severe safety-related events, was not supported. That really just goes down to power. We didn't have enough participants to show that the reduction was

significant. However, we were able to show the videos were really the reason for the behavior change—really powerful.

SLIDE 40: CONCLUSIONS (1)

I just want to note that the concluding differential the intervention impact between Carrier A and B is risky. You've got to remember the safety managers. You also have to remember that even though these have a similar safety culture and similar SafeStat scores, they really have different traffic encounters. If you look at local short-haul, these drivers are mostly on primary and secondary roads, whereas long-haul drivers are mostly on interstates—really concluding differential impact is inappropriate.

Drivers were also aware of the instrumentation, thus there may have been some reactivity. They could have performed safer. However, I really don't believe this influenced intervention impact, because the device was recording across both phases, and the event recorders were actually installed weeks prior to data collection. We couldn't install 50 trucks in one day. It actually took several weeks, so some drivers had these things in their trucks, although they weren't recording data for several weeks. However, if there was any reactivity, that effect is going to be prominent at the beginning of the study, during the baseline phase. Essentially, if there was any then, the baseline phase may have been understated, so we would have had a more powerful intervention impact.

SLIDE 41: CONCLUSIONS (2)

Technical issues at Carrier A had an adverse effect on intervention impact. Remember, we had 13 malfunctioning event recorders; we're missing baseline data in eight of these and five of them we had to exclude from the study altogether. Remember the baseline phase was likely higher than shown. Also, we didn't instrument an entire fleet. We just took 50 drivers at two terminal locations. There could have been some selection bias on the part of the safety managers. They're the ones that selected the trucks to be instrumented. Also, we're just not able to determine the fleet-wide benefits, because we did not install across an entire fleet. Again, this was just a pilot test.

SLIDE 42: CONCLUSIONS (3)

The pilot study really relied on the power of feedback to alter drivers' at-risk behaviors. However, if you really look at the literature it's really goals and feedback that really resulted in behavior change. Future research should really add goal setting. As we were the independent evaluators, we were basically assessing the commercial available program. If we would have assessed goals, that would have given the implicit idea that drivers should set goals. So, we really didn't assess that. Although there was behavior change, it's likely that drivers were setting goals, maybe not specific goals, but goals just to get better.

Also, the safety climate—again, the safety culture of these two organizations was similar and that's kind of a macro level, but when we look at the micro level, the safety climate of each

carrier was different. I'm really talking about the safety managers. Again, this is really why it's important to have that face-to-face, basically safety manager-to-driver interaction. That's really important. At Carrier A, this safety manager had the trust, had the rapport with the drivers, so essentially, the roll out was very smooth and drivers were essentially willing to try the program.

Whereas, at Carrier B, this individual was really put in a tough spot, putting video cameras in a truck, a new safety manager that really just didn't have the same level of trust and rapport. That's asking a lot of this individual. Really, drivers were suspicious of the program and they actively, kind of, tried to circumvent the program.

SLIDE 43: CONCLUSIONS (4)

Drivers at Carrier B improved even though their evidence suggested that safety managers didn't follow the protocol. However, what was going on here was that probably all drivers were receiving some type of feedback. Again, they're receiving messages via the dispatching device to decrease certain at-risk behaviors. There was some sabotaging at Carrier B that cast some doubt on the results. We had 278 events where the driver face camera was blocked. Essentially, when a driver's face camera is blocked, we don't know what's going on. When I showed you the examples video—an event like that we included as a safety-related event, but for example, maybe a driver hit a pothole and maybe the video went off and it showed he was talking on a cell phone or unbuckled, we would not know that because the in-cab behaviors were unable to be viewed.

SLIDE 44: CONTACT INFORMATION

I guess we would like to open up for question at this point.

[39:49]

QUESTIONS AND ANSWERS

Kirse Kelly: Hi, this is Kirse Kelly. Thanks a lot Jeffrey. Like he says, we are now open for questions. If you would like ask a question, you can, once again, submit them by typing them in the space at the bottom of the **Q&A Box** on the left side of your screen, or to ask questions over the phone, press ***1** and state your name to the recorded message. When your line is opened, Angela, our phone operator will announce you by name. Please state your name clearly for proper, pronunciation. The questions will be answered in the order that they are received.

As I mentioned at the beginning of the call, please note, 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 come back to this Website and they'll be available. Also we will be posting them on our Website at DOT. It

should be by the end of this week. So, if you would like to go to that Website. That also can be done.

Alan Smith: ***How many different vendors applied?***

Kirse Kelly: Did you answer that one already?

Dr. Jeff Hickman: No I didn't answer. For this particular study, there were two. However, since we started the study, I believe there are more vendors offering these services.

Rick Preston: ***Did carrier A safety manager note any correlation between drivers who were not receptive to coaching with drivers who had worse past safe driving records?***

Dr. Jeff Hickman: I can get that a little bit in the final report. Essentially, drivers at Carrier A were pretty much all positive to it. I actually asked that same question to safety managers and their perception was that drivers were pretty positive of the whole experience. Again, I didn't actually ask that specific question.

Bill Purcell: ***What is the "lag-time" between an event and the posting of the event video on a Website?***

Dr. Jeff Hickman: Again, I don't want to get too specific on questions related to DriveCam technology. I'd feel more comfortable with them indicating that, but I believe it is 24 to 48 hours, unless it's collision—then I think it gets there quicker. Again, don't quote me on those, that's my belief. You'd really have to ask someone from DriveCam on those specific questions regarding their technology.

Paul LeRoy: ***How did drivers from Carrier B circumvent the program?***

Dr. Jeff Hickman: Most specifically by putting something over the driver face camera. They had with the forward facing camera, but they believed that driver face camera was an invasion of their privacy. So, a lot of drivers put a hat or something else over the driver face camera even though they were instructed not to.

That was pretty much not existent at Carrier A.

Andre C.: ***Doesn't this technology raise very serious ethical programs for the employer—sort of a follow-up on what you just said? In the case where the driver hit the media, should the employer have reported this incident to the authorities? This matter could amount to leaving the scene of an accident, which could have its own implication for the employee.***

Dr. Jeff Hickman: Yeah, I guess unless if it was a DOT reportable, like that threshold, I would say "No," but again, I am not a lawyer. I think carriers only have to report DOT-reportable incidents, and there is a certain operational definition for

what that is—and I don't know what it is off the top of my head. Yes, there are certainly privacy issues. We could do a whole forum on those actually.

Virginia Spence: What is the projected annualized cost to review the data daily for all drivers for a "targe" fleet? Excluding the technology cost.

Dr. Jeff Hickman: Again, you'd have to consult with DriveCam on that. I do not have that information. That could vary by the size of the carrier. I'm unsure.

Karen Healey: Have you done any follow up to see if these initial results are sustainable?

Dr. Jeff Hickman Not with the carriers in question, though we have proposed a longer—again, this is a pilot—we have proposed a longer-term study that will look at, basically, a return on investment. Monitoring drivers over a two-year period and really getting at a cost-benefit analysis.

Kirse Kelly: Angela, are there any questions over the phone at this time?

Angela: No Ma'am.

I'm sorry, we do have one from Stan. Go ahead your line is open.

Stan: I'm just wondering in litigation, if we've seen any of this go to litigation in trials?

Dr. Jeff Hickman: Again, I can't comment on that. I can only tell you, based on my conversations with carrier personnel and DriveCam, that this saves the carrier money through decreased litigation. So, essentially, we have the video so you know whether to settle or continue. If it's the driver's fault, you can show that. You basically know that you don't have to go to court, reducing your legal costs. That's what I have heard by word of mouth, but I do not have any data to support that.

Virginia Spence: How does the 38.1 percent reduction in safety-events relate to an improved cost-benefit experience?

Dr. Jeff Hickman: Yeah, I kind of touched on that. This is a pilot test and we proposed a longer-term study that's really going to look at crashes, because that's where we're going to be able to assess the cost-benefit. These are looking at risky driving behaviors. We need a longer term study to really look at reductions in crashes. We have proposed that, and we hope FMCSA funds that in the future. So, I can't answer that question right now, but I hope to be able to answer it in the near future.

Kiley Taylor: What is the cost of the camera unit?

Kirse Kelly: Now, can people just look this up online?

Dr. Jeff Hickman: You can go DriveCam.com. I don't know—again, I don't know if they do this by the size of your fleet. We define low-cost as less than $300. That may have changed from the time of the study to now.

Chris Hayes: Have either of the companies continued to use DriveCam?

Dr. Jeff Hickman: To my knowledge, no.

Mitch Mulanix: How can I get a copy of the study?

Kirse Kelly: Right now it is still in publication process. You should be able to get it online in the future. Once again, it's in publication process, so, we don't have a specific time.

Ian Noy: Please elaborate the definition of severity scale.

Dr. Jeff Hickman: Basically, we had operationally defined it based on the event score, and this is a score basically derived from—I really don't know how DriveCam did it. I didn't get that. They wouldn't kind of give me that information. I guess you could say it's kind of proprietary. Essentially, the higher the score, the higher the severity of the event. Like I said, three would be a driver unbelted; a six might be driver unbelted and on a cell phone; or a near-crash event while a driver was on a cell phone might be a seven. So, it's kind of like a sliding scale where the higher the score, kind of, the more severe the actual event and the more stuff—I guess the more at-risk behaviors that were ongoing in the event. I don't know if that answers your question.

Kirse Kelly: Ian, if you want to take that question any further, you can just hit ***1** and we'll put you on as soon as you get on.

Angela, are there any other questions?

Angela: I'm not currently showing any on the phones, no.

Steven Norbeck: Was the OTR carrier a team or a single operation?

Dr. Jeff Hickman: Single.

Steve 2: What were the key limitations of the in-vehicle video systems, and what additional features or benefits would you want to see from the system?

Dr. Jeff Hickman: Limitations: I'd say the limitations are just the fact that you're not having continuous data collection, is one limitation, although, not—for the purpose of this particular system—not really a significant limitation, and the absence of more video cameras. Again, you're talking about a low-cost system so that's why you're restricting it to two video cameras. When you have video, it doesn't lie. There aren't too many limitations essentially, because you can see exactly what's going on in the video. You can't circumvent it unless you

cover it up. Even if you cover it up—you know when they cover it up and you can tell them not to, and threaten disciplinary action if they do. So, off the top of my head, other than adding additional cameras or having continuous data collection, the video—there really isn't any limitations.

Mike Segal: ***Please further describe your conclusions of improvement in the absence of statistical significance.***

Dr. Jeff Hickman: Good, I was waiting for the statistics question. This is a good question. Again, this really comes down to something that's statistical, but not practical or vice versa. So, you can say, well, the results, we can't show that the two means were different, but it has "practical significance," or you might want to say "safety significance." Even though it's not significant, you can say that a 75 percent reduction in these severe events—that's a practical reduction. That's a noteworthy reduction. It may not be significant, but that has practical implications if you're a fleet manager, or a carrier, that you can reduce those events by 75 percent. We just didn't have enough power to detect the difference.

Tom Anderson: ***What were your costs per truck, per year estimated?***

Dr. Jeff Hickman: I am not sure I really understand that. Our costs were associated with actually designing, running, conducting and analyzing the data. Again, DriveCam sort of gave the carriers all this equipment for free. They did kind of the support services for free. I believe they only charged the carriers for cellular time for transmitting the events. Again, you'd have to refer to DriveCam if you're inferring what's the system-cost per month.

Ed Dodenhoff ***What other interventions were going on simultaneously?***

Dr. Jeff Hickman: I do not know of any at this time, but I can surely find out.

Steve Freysz: ***Are there any additional larger scale studies of this type of system that are planned?***

Dr. Jeff Hickman: Yeah, there are two in the works, hopefully. We'd like to do a larger study with a more advanced system that has a variety of video cameras—we're talking radar systems, any type of system you can think of. We will help do a system like that, essentially what you would call a higher-end system with much more capability. Again, we'd do a longer-term study with what you would call "low cost system" to really see if there's a cost-benefit analysis. So, there are two studies kind of in the pipes that we hope that FMCSA funds.

Niki Cung ***Why did the 14 drivers quit?***

Dr. Jeff Hickman: I don't have that information. I'd have to get back with the safety managers. Again, 14 drivers, they could have quit, they could of resigned or they could have been fired, turnover, or again, they didn't meet the requirements of our

data collection. If they came on during the intervention phase and didn't have any baseline, essentially, we didn't include them.

Scott Transue: ***Just wanted to confirm that the system does record continually, but the operator can only view incidents triggered by g-force instances. Therefore, if a driver is doing something illegal, the vehicle will then be able to be seen by the manager to review the driver's illegal activity in question.***

Dr. Jeff Hickman: No. Yes and no. Essentially, yes it's constantly recording, however, unless that criterion is met, that data isn't being saved. Essentially, if a driver has a truck parked and he was drinking alcohol in his truck and he's not suppose to drink alcohol in his truck, and nobody hit his truck, he was just sitting there parked, nobody would ever know. However, if he was doing the same thing, parked the truck, drinking alcohol and somebody hit him, that would make the device record the event; then you would get to see that. So, yes and no, I guess. That criterion had to be met for the data to be saved to. So, there's no remote access where somebody can tap into the system and watch you.

Barry David: ***Do you have any information about on a driver coaching course, such as training for managers to coach drivers?***

Dr. Jeff Hickman: Yeah, there are plenty of behavioral safety consulting organizations out there. I don't want to note any because that'll be kind of an endorsement of one. You can look for—"Behavioral Safety Now" is an organization where you might be able to get some stuff. I'm sure ASSC has some information. Again, I'm not going to note any because that would kind of be an endorsement. So, I'm going to stay away from that.

Chris Parker: ***Is it anticipated that the study will be extended, to determine if the system remains effective as a deterrent?***

Dr. Jeff Hickman: Not for the fleets in question. We've proposed another study with a different fleet that is going to be a longer-term study. Again, we're going to really look at reduction, not only in at-risk driving behaviors, but crashes. It can really determine the cost-benefit analysis.

Kirse Kelly: Are there any questions on the line right now, Angela?

Angela: No, we are showing no questions on the phone.

Richard Clemente: ***Were there common areas of improper driving behaviors found (i.e., improper cell phone use) found from the video observations?***

Dr. Jeff Hickman: I'd have to look at the frequency counts. Again, since the safety managers weren't, in a sense, targeting a specific behavior, that's kind of like a loaded kind of question. They were pretty much able to eradicate safety belts—drivers driving around unbuckled. They were pretty good about that. The

problem with interventions like this is that you commonly focus on a few behaviors and when those behaviors reduce, then you pick another few behaviors. It was just such a short-term study that kind of looking into those frequency counts at different behaviors is very difficult.

Niki Cung: ***What were the reasons for the 13 malfunctions?***

Dr. Jeff Hickman: I can't get into the exact technical details. Essentially, the systems just got fried for some reason. We think it was some sort of electrical reason. Again, I'd have to get back to DriveCam on exactly why the reason. Initially, we thought that it was just the antenna broken. They had the events; they just couldn't send them. So, we went on with the study and it just turned out that data was gone. So, I don't know the specific reason. It was something that was not common to their event recorders. These systems have been in vehicles for many years.

Dennis Swindell: ***How did the majority of drivers react to the "Big Brother" is watching concept?***

Dr. Jeff Hickman: That's a great comment. Again, the difference of the two carriers—if you have a good safety manager that has good rapport and good trust, a good safety culture, the drivers are well aware what the system is and how it's going to be used, I think they're professional. Their attitude is: I'm not doing anything wrong—and you have to look at it from their perspective. When something, a passenger car and a truck kind of collide, more often than not the passenger car is going to try to blame the truck driver. They want—you know, "The carrier's got deep pockets; I'm going try to make it their fault." The police officers are kind of the same way, so they [the drivers] kind of like the system in that regard—where it was protecting them. However, we can see at carrier B, where we had a less than perfect roll out, we had a new safety manager, and with those drivers, that was the main concern. "Is 'Big Brother' watching? Someone's going to be able to remotely watch my behaviors." I think if you nip that in the bud at the beginning, you're going to have less issues.

Ed Dodenhoff: ***Was positive feedback provided in any fashion? It seems that emphasis was based on negative activities versus positive behaviors.***

Dr. Jeff Hickman: Yeah, and that's a good point. That was at the discretion of the safety managers—to give positive feedback for something that was done correctly. For instance, a passenger car—this is a common thing for trucks—cutting off a truck, and they were paying attention, and they were able to stop in time; so you might want to bring a driver in and show him that. To my knowledge, I don't think there were any of those going on, because I was only looking at negative events, if you'll say—that's what my analysis included. I don't recall off the top of my head whether that occurred or not. But they were instructed to do that. Again, that's the thing that makes the system kind of worthwhile—to kind of sprinkle that in there and that it's not just this negative process, but

this positive process that people are doing the right thing. I think if you're going to have an effective program, you're going to have to do both. DriveCam does instruct people to do that.

Dominic Paul Piamonte: ***Were the videos made accessible to police or court for legal purposes?***

Dr. Jeff Hickman: In this particular study, I don't know of any knowledge of that. Again, as far as litigation goes, that's far down the road. I'd have to go back and ask them. Essentially, once the data is out there, you can't hide it. It has to be shown. Again, we're talking to a lot of people; this really in the end supposedly saves them money, because they know whether to continue a case or to settle. They know whether it exonerates the driver, or whether "it was our fault and we should just settle." But essentially, once the data is out there, you can't hide it. You can't exclude it; it's there.

Dennis Collins: ***Did safety managers or users express concerns over the use of data from the system in the event of a crash?***

Dr. Jeff Hickman Yeah, that was obviously a concern in the beginning. Their legal team went over what we were doing and consented to it, so it was good enough for them.

John Ngai: ***Are there any plans to revisit Carrier A and Carrier B to see if improvements held up?***

Dr. Jeff Hickman: Well, we're a soft research institute, so obviously, if somebody supplies us with funds, we'd be more than happy to go back and follow-up. Given the driver turnover though, some drivers will not be there in all likelihood. That's one of the issues with follow-up studies in a carrier setting. Driver turnover can be extremely high.

Kevin Jones: ***Was Carrier B unionized? If so, were there any issues there?***

Dr. Jeff Hickman No, neither of these were union carriers.

Steven Norbeck: ***Does the "other part" in a crash have access to the video in an event?***

Dr. Jeff Hickman: Again, once that data is there, you can't exclude it. So, yes. Yes—essentially, you can't keep it for yourself if it shows you're at-fault—I mean, you could, but you'd be breaking the law.

Greg: ***Did either carrier decide to keep the cameras in place permanently?***

Dr. Jeff Hickman: To my knowledge, neither carrier is keeping the cameras in place currently. You'd have to ask them for the reasons why. We're able to show reductions in safety-related behaviors. Again, it might get at that cost-benefits, and that's why we need a longer-term study to show the cost-benefit. Is this really—are

you really going to decrease your costs overall, as well as crashes and at-risk driving behaviors.

Kirse Kelly: One moment before we continue with questions. We're a little after the hour, and we will continue with these questions. However, for those of you who have to leave, you can download a PDF version of the presentation at this time. You just need to highlight the document in the **Download Presentations** pod on the lower-right side of your screen. You highlight that document, and click **Save to My Computer**, and that will be provided for you.

Angela, are there any questions on the phone right now?

Angela: No, we are showing no questions on the phone.

Jean-Paul Paraskevas: ***Did any drivers report an obstruction of their view as a result of the installation of the event recorder?***

Dr. Jeff Hickman: We did, and that's on that post-study questionnaire. We asked them what could be changed about the system. I'm going off the top of my head, maybe that was—I think one or two drivers said the blinking light was a little distracting at night. Maybe one driver said it blocked it—I'm going off the top of my head, though. I think the blinking light was a little distracting towards the night, but as far as the device, it's very small, it's kind of like a calculator, or a deck of cards.

Paul LeRoy: ***Would we contact our state representatives to support the 2-year study or is there someone else we should be contacting?***

Dr. Jeff Hickman: You could contact the Federal Motor Carrier Safety Administration. Maybe tell them they should throw in some money for this, or state organizations. These type of studies can be fairly expensive. We'd be willing to work for different organizations. We have no problem with that.

Jaynie Searcy: ***How long is the video kept and is it considered supporting documentation during a review?***

Dr. Jeff Hickman: Again, the company owns this data and essentially, I believe—and again, you'd have to refer to DriveCam for the exact—I think they save it on the server for 90 [days] to six months, and then it goes into their storage for a fee, I believe is how it works. Again, I could be wrong. You'd really have to contact DriveCam. In essence, DriveCam holds that video data, but the company owns it.

John Ngai: ***Who were the other vendors that were considered?***

Dr. Jeff Hickman: They're going to remain anonymous at this time.

David McPeak How does a company apply to be part of a future study?

Dr. Jeff Hickman: You can just e-mail me. My contact information is on one of the slides that may be posted. It's jhickman@vtti.vt.edu. Incidentally, one of my associates may have already contacted you to participate in one of our upcoming studies on on-board safety systems.

David McPeak Can a driver alter the footage once an event is recorded?

Dr. Jeff Hickman: Unless they ripped the whole device out, or had some technical savvy—again, I guess anything can be done, but unless they actually rip the device out, then no. This thing's on 24 hours a day—even when the truck's off, it's on.

Brad Heffron: Do you feel that the later upturn in Carrier B's intervention results was an effect of poor consequence management post incident??

Dr. Jeff Hickman: Again, that's the trouble with doing the independent evaluation. You are kind of like a fly on the wall, so you don't want to contact the people or safety manager because that might influence the study. So I don't know. That's the one problem—you don't want to influence the data, but at the expense of maybe not getting some important data. So I don't know.

John Ngai: Thirteen out of 50 units that malfunctioned in Carrier A, what about Carrier B?

Dr. Jeff Hickman: We didn't have any malfunctioning event recorders.

Kirse Kelly: And you all ready answer the question about how they malfunctioned?

Dr. Jeff Hickman: In the end, I really didn't know. The bottom line was—we really just—the events just wiped out. I could find out from DriveCam what the problem was, but I don't know specifically what it was.

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

Angela: No ma'am.

Dr. Jeff Hickman: These have been installed in over 40,000 other vehicles, so this is kind of a rare occurrence.

Steve Reed: How much non-event video was captured?

Dr. Jeff Hickman: Again, this gets into not-continuous data collection, and also the non-event video—we didn't have. Again, DriveCam was responsible for reducing the video, so, I don't know what the proportion is. All I can tell you is we have done studies like this, naturalistic seetings with continuous data collection and typically it is 100 to 1. For every 100 events we get, one is safety related. I don't know what the proportion is for DriveCam.

James Derr ***Do you know when the presentation will be posted to the FMCSA Website?***

Kirse Kelly: We are hoping by the end of this week. So, on Friday some time, we should have that posted for you to download or you can download it here.

Are there any questions on the phone? It looks like we do not have any more here.

Angela: We are showing no questions on the phone.

[1:08:12]

Kirse Kelly: All right. This concludes the presentation part of our webinar, but before you sign off, please complete the evaluation that you see there on the screen. We welcome your comments about this webinar and your suggestions for future webinars. Please note, however, your comments can be viewed by all other participants in the meeting room. If you'd like to remain anonymous, click on **Everyone** and just choose **FMCSA Host**.

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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 phone number is (202) 366-9999 if you have any questions. Once again, that's the FMCSA Office of Communications, and their number is (202) 366-9999.

On August 12, we're going to host a webinar entitled Keeping CVISN Vibrant. In this webinar, Kwan Quan from FMCSA's Technology Division, will provide an examples of what states have done to successfully maintain their momentum or re-energize the Commercial Vehicle Information Systems and Networks or CVISN programs, which have lost their focus or functionality.

On August 26, we'll host a webinar entitled National Truck and Bus Crashes: A First Look at 2008 Data. In this webinar, Dr. Ralph Craft of FMCSA's Analysis Division will review the 2008 annual large truck and bus crash data from NHTSA and FMCSA that was released in July.

Registration for these webinars should be open by the end of this week, or the beginning of next week. They're not available right now, but by the end of this week or beginning of next week they should be available. You just need to go to our website at www.fmcsa.dot.gov/art to register. We'll also be sending out announcements of these and other webinars, so if you're not yet on our e-mail list, please contact the web conference coordinator—that's

me—at Kirse.Kelly@dot.gov and just request that your name be added to that list.

So that concludes this webinar. Thank you all for participating. Thank you very much, Jeff, for your presentation, and thanks also to Angela, our phone operator.

[1:11:18]