



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

OFFICE OF ANALYSIS, RESEARCH, AND TECHNOLOGY

Wireless Roadside Inspection Research Program

November 7, 2007

Webinar Summary*

Presenters

- Jeff Loftus, Transportation Specialist, FMCSA Office of Analysis, Research, and Technology (ART)
- Gary Capps, Oak Ridge National Laboratory
- Valerie Barnes, Johns Hopkins Applied Physics Lab

Speakers (optional)

- Kirse Kelly, Web Conference Host, FMCSA ART

Description:

This webinar highlighted FMCSA's recent successful proof-of-concept technology demonstration of downloading driver identification and hours-of-service information from a truck and motor coach at highway speeds. A discussion was held following the presentation, and insightful feedback and suggestions were gleaned from industry representatives regarding this revolutionary safety enforcement program.

Presentation—FMCSA's Wireless Roadside Inspection Program

PRESENTATION TITLE SLIDE: FMCSA'S WIRELESS ROADSIDE INSPECTION PROGRAM

Leanne (Operator):

Welcome and thank everyone for standing by. At this time, I'd like to inform all participants that their lines will be in a listen-only mode for today's conference call until we're ready to take questions, at which time you may press *1 to ask your question. Also, I'd like to remind everyone today's call is being recorded; if you have any objections you may disconnect at this time. Now I would like to turn the call over to Mr. Jeff Loftus. Sir, you may begin.

Jeff Loftus (Transportation Specialist, FMCSA ART):

Thank you Leanne. This is Jeff Loftus with Federal Motor Carrier Safety Administration. I just want to thank you all for taking time out of your day to join us for this webinar. We are going to be discussing the Wireless Roadside Inspection Research Program that the FMCSA is pursuing, and we are really excited about having you on the line so we can get some good feedback.

We have the poll up here right now. We are going to close this down in the next minute or so, but we will bring it back at the end of the webinar if folks get on afterwards and don't get a chance to describe their perspective and who they represent. Why don't we transition over to the slides, and we'll get started on the webinar.

Basically, there's going to be two big pieces for this webinar. We're going to have the first 30 to 45 minutes or so educating you and providing some presentation of this program, and the details from the general to the specific, as well as describing the demonstration of our first phase of the program in August.

Then, the most important part is the latter half of the webinar, where we are going to open up all the phone lines to take your questions and to hear your feedback for this research program. We will have two ways to ask a question. You can do it via the telephone connection that you have, and also, if you would like, you can write in a question as well. We will be addressing them when we open that up for this section.

For the first half, obviously, we are going to have you hold your questions. If you have a question on a particular slide, just note the slide and we can track back to that slide during the question and answer period.

The presentation slides will be made available at end of the webinar for you to download.

One more thing, we are going to have some video segments on this presentation as well. Please make sure that your speakers for your personal computer or your laptop are on so you can hear some of the speakers for the video clips that we have.

All right, with that, why don't we go to the next slide?

SLIDE 2: OUTLINE

This is just a view of the outline for today's discussion.

In terms of folks that are on the speaking end of it, we have, in addition to myself, we have Gary Capps who is with the Department of Energy's Oak Ridge National Laboratory as one of our lead test engineers; we also have Valerie Barnes from the Johns Hopkins University Applied Physics Lab, who is providing support on the architecture side, and we also have Jim Bunch from Noblis, who is also providing some program support.

In looking at the folks who signed on, we have representation from a variety of different types of motor carriers, both in size and operation type, and also safety advocacy groups, state agencies, federal agencies, academia—pretty much every stakeholder group that FMCSA interacts with is represented on the line today and I think that's fantastic. I also want to personally thank Dan Murray at the American Transportation Research Institute for helping us get the word out for the Webinar. We had over 130 people register for today's event, so we're very excited, and I want to thank and recognize Dan Murray for his support on that.

Okay, why don't we jump ahead?

SLIDE 3: THE PROBLEM

In terms of framing this discussion, we always look at what are the safety challenges of the problems that we're trying to solve.

These are some of the underlying data points we are using.

The first bullet being, looking at the crash causation data, if you looked at all fatal car crashes, both involving multiple vehicles or just the truck, a single vehicle, the majority of them, 64 percent of the crashes have a critical reason linked to the truck. What that means is—the **critical reason** was the event that made the crash imminent. We recognize that it's a minority of operators that are causing the majority of the safety problems out there.

If you were to look at some of the other parts of this dataset—two-vehicle or two-or-more-vehicle crashes, I believe it's 55 percent, it's the other vehicle that has a critical reason, to 45 percent being the truck. The truck is a major player in both vehicle-crash types.

Another obvious trend is the fact that the numbers for trucks and mileage continues to grow, while roadside safety enforcement resources remain relatively constant. What this has the effect on, is that the likelihood of getting a roadside inspection is a lot less than being weighed at the roadside.

We looked at the inspection data and our weighing data from our friends at the Federal Highway Administration (FHWA). We conduct through our state partners 3 million annual truck inspections and in three out of four almost, of those inspections, there's some violation type that's noted. Again, there's literally hundreds of different things could be checked in these very

thorough roadside inspections, and they are targeted inspections. These are not random inspections, so they are looking for problems, and so the numbers are a little skewed.

In a fourth of these inspections, there's an out-of-service condition, OOS stands for out-of-service, which means that the vehicle is an imminent hazard, and is put off to the side of the road until the problem is fixed, or the driver has an out-of-service condition—perhaps not properly licensed or over their hours-of-service limits. It's a fairly significant number, nonetheless.

If you look at the weigh inspections, there are about 177 million done each year by a lot of the same staff that do the safety inspections. Those are kind of cut in half between 82 with people doing the weighings and 95 using WIM or Weigh-In-Motion, electronic weighing systems.

The number of citations is about 500,000 out of 177 million, so it's less than a third of a percent of violation rate. Clearly, the operators, the carriers out there, know they will be weighed if they are a certain type of operation going by the scales, but the likelihood of getting inspected is far less. We were thinking that if we looked at this as an analogy, if we could increase the number of electronic inspections or wireless inspections to a similar number of weigh inspections, that we would have a similar deterrent effect.

We did some analysis on this hypothesis looking at the State of Montana, where they had an instance where they had to shut scales down. When word got out that their scales were down, the weigh-in-motion systems that were never turned off registered significant overweight behavior by the trucks on those roads. When the scales were re-opened—and I believe they were shut down for maintenance, I need to confirm that—but they were reopened, the compliance went right back in line. Clearly this is an approach that we're looking at.

SLIDE 4: WRI PROGRAM VISION (THE SOLUTION)

As I've already alluded to, we think a solution to have a quantum leap in safety would be installing and deploying a wireless roadside inspection solution.

The vision, the end state, would be to level the playing field and dramatically improve motor carrier safety by just having a similar number of roadside assessments of driver on status as well as vehicle status, as frequently as truck weighing checks, such that they would be so frequent for the minority of unsafe operators—in terms of the minority population of unsafe operators—that it would be a deterrent effect and it would have the impact of preventing crashes related to those factors, such that operators would not go over their hours and they would not have substandard equipment on the highways, while at the same time leveling the playing field and not hindering the flow of safe and legal freight.

Now, sharing his personal views on this vision and some of the opportunities, I have a video clip of FMCSA Administrator, Mr. John H. Hill discussing this.

If you make sure that your speakers are on before I press play, I will turn that over. Thank you.

[10:29]

VIDEO CLIP: MR. JOHN HILL, FMCSA ADMINISTRATOR, AT THE FMCSA SHOWCASE IN AUGUST 2008

John Hill, FMCSA Administrator:

Well, the most exciting thing to me is the potential that we have here of expanding the number of inspections that we're doing throughout the country. Right now we're doing three million inspections a year, nationwide. And with this kind of technology, if it were fully developed, we could do probably 170 million inspections. So, that's a lot of public safety that's being improved by technology.

[10:51]

SLIDE 5: WRI PROGRAM GOAL

That video clip was from the showcase that we did back in August of this technology, and we'll be showing more video clips from that event and discussing them more in detail.

The research program goal of this effort is to demonstrate and measure benefits to government, industry across a multi-state region involving tens of trucks—and motor coaches, I might add, since we'll be able to do motor coach assessments without having to pull them into the stations—so that we can have enough data, enough information on an economic standpoint, technical standpoint, institutional as well as procedural, so that we can provide that information to decision-makers, and have a go/no-go decision for deploying this idea nationwide.

SLIDE 6: OPPORTUNITIES FOR TECHNOLOGY

We looked at existing roadside inspection data for this scheme to see if it was viable. When we look at that, the items in green on these two tables, one representing driver violation, and one representing the vehicle violations, are the most frequent violations recorded. Items in green are able to be measured electronically, and communicated electronically today.

With brakes, obviously there would need to be ABS brakes as well as some additional sensors on them.

Also tires would require some tire-pressure monitoring, sensors and the like.

Then the log books, and CDL, would require onboard recorders.

I think there are a lot of opportunities for technology to identify the problems and things that we're seeing at the roadside inspections we currently do.

SLIDE 7: OPTIONS FOR AUTOMATED IDENTIFICATION

We're looking at different options for automating identification of drivers and vehicles and companies at the roadside. We're doing this in partnership and also in support of the agency's Comprehensive Safety Analysis 2010 Program.

We're looking at different means of doing that in terms of having machine-readable license plates, using license plate readers, using the transponders, transponder is a device that sends, receives radio signal, known as a transceiver. There are currently several thousand trucks; I think 300-400 thousand trucks are participating in the PrePass and NORPASS programs that have this transponder.

We've also looked at a more advanced transponder that's integrated with an onboard computer measuring hours-of-service information.

We're also looking at transponders that perhaps could be built into license plates or using existing transponders that perhaps customs is already installing on trucks crossing the international borders in Canada and also in Mexico, using their windshield RFID tag affixed to the windshield. We're looking at a variety of different identification means, but also communication paths.

Before we go further, I wanted to also note the crash data, inspection data for the program can be found in our research report that we've recently posted to our FMCSA homepage. If you go to the homepage and click under Research, facts and figures, you'll see under reports, the listing for that and it's entitled *Development and Evaluation of Alternative Concepts for Wireless Roadside Truck and Bus Safety Inspections*.

SLIDE 8: WIRELESS ROADSIDE INSPECTION SYSTEM OVERVIEW

Now we will delve into a little more detail in the system here, I want you to focus on the big boxes; this represents the big pieces involved and the key entities.

Obviously there's the vehicle, which involves the onboard systems and the driver of the vehicle, and the lower box, and the roadside assets, which would be both fixed and mobile assets. You see the little icon of a police cruiser there, and multiple means of communicating with those fixed and mobile assets.

Then obviously the most important would be the back office systems, both on our state partners, our federal systems, and also motor carrier and motor coach company systems.

Those are the big pieces that we are looking at.

The next slide, will give you a sense of the flow of this concept. Follow along with the numbers here.

SLIDE 9: WIRELESS ROADSIDE INSPECTION CONCEPT

The vehicles, the truck and the bus are driving along the road and identifiers, the driver ID, vehicle ID, perhaps the vehicle identification number and the company ID, the DOT number, is combined with the driver record of duty status information that would be coming off of an onboard recorder, and would then be packaged into a safety data message set. That information would then be transmitted to the roadside wirelessly, either to a fixed asset or to a police cruiser driving alongside the truck or the bus.

Then it would hit against back office systems that have been preloaded into those fixed and mobile assets. This message set would be verified, archived, but also be sent to the motor carriers at the same time they will be transmitted to the state systems, to make sure that motor carriers are aware of the transfer of this data and also provide an opportunity to identify accuracy issues or errors and the like.

Let's go back a minute. The other thing to keep in mind is that this data would also potentially be used to update a company's safety fitness ratings, as well as driver safety status. The key thing to keep in mind on this concept is that the enabling technologies we are looking at right now is some type of onboard computer and some type of two-way communications with the vehicles. Those are the two key enabling technologies that we're looking at.

Another key concept is these enabling technologies is the fact that it could happen in real-time, in terms of these real-time assets, and also that it could happen in non-real-time, in terms of a more automated inspection scheme. I will discuss that a little bit later.

SLIDE 10: DRAFT SAFETY DATA MESSAGE SET (SDMS) CONTENTS

This is some detail into what's in this message set, the safety data message set, as we have drafted it to date.

This is all draft, this is all preliminary, and this is not final by any means. You see in the big categories—in the larger box are things we think could be done relatively easily and cheaply today in terms of identifiers, and then the vehicle measures; vehicle status coming off of the data bus; the electronic onboard recorder data. And then potential future vehicle status parameters: we listed some items there which would take either the—for instance, with brakes, the introduction of more ABS-type systems, as well as perhaps some additional sensors and the like.

This is kind a of working draft that we have. You'll see later on in the presentation what we did with our field testing, our first phase of field testing and what we did there, but again, this is open for discussion and we really welcome your input on them.

SLIDE 11: WIRELESS ROADSIDE INSPECTION SYSTEM: MAJOR USES OF SAFETY DATA MESSAGE SET (SDMS) INFORMATION

Then, transitioning to what's in the message set is "What are the uses of this message set?" and "Who are the key users of it?" Obviously, the vehicle and the driver, in the upper-right hand

corner, would be made aware of this message set being combined and being sent. It would be sent in the lower-right hand corner to roadside law enforcement and compliance staff/systems in terms of doing a real-time screening decision or perhaps the vehicle is already stopped and it is in the queue to be weighed or inspected. It could be done as part of a physical inspection, but also could be done in real time to trigger a roadside interception by a mobile unit.

In the lower left hand corner, from a federal/state data systems standpoint, the data could be used to update the safety rating, and to be done in more of the automated inspection idea that I shared earlier.

A key item here is that right now this scheme of doing weekly checks of driver status and vehicle status could also provide perhaps a more accurate measure of performance by a motor carrier and their drivers and vehicles. Right now my general understanding is that the way we evaluate safety performance is the number of negative or unsafe events divided by power units, more or less. This approach of doing wireless inspections could change that approach perhaps, by providing millions of events in the denominator. I would argue or speculate that they would be more positive events in the denominator. That would be, then, divided into a limited number of negative events. It's an opportunity to provide a more accurate performance-based measurement of carrier safety performance.

Then, obviously, a key user of this data would be the fleets of motor carriers and motor coaches—and I recognize that motor coaches are motor carriers, but I wanted to that we aren't just talking trucks, and providing this data to the fleets for fleet management purposes, and also an opportunity to contest if the information was not accurate.

SLIDE 12: WIRELESS INSPECTION CONCEPT DEPLOYMENT PLAN

In terms of what it would look like if it was fully deployed, and this is coming from the research report that I mentioned earlier that you can download from our reports page under the Facts and Research Section of the FMCSA homepage. We estimate that it wouldn't take a lot in terms of deploying roadside systems. We would equip the existing fixed facilities, which are 1200 to 1400 number, maybe another thousand cruisers out there, I'm sorry, 500 police cruisers, and then a thousand virtual inspection stations. A virtual inspection station would be a roadside reader and perhaps a weigh-in-motion scale on the ground that would be not staffed, but perhaps at the bottom of a long downgrade, or perhaps at a bypass route where unsafe operators would try to get around this fixed facility.

From the carrier industry standpoint, what the carriers would need to deploy would be the enabling technologies that I shared earlier, which would be some type of onboard recorder and some type of means of communicating with the roadside in terms of transceivers, transponders—but also, perhaps, existing commercial mobile radio services that are already deployed in many fleets. We haven't decided that it's going to be this transponder or that transponder. We are open to different communication means at this point. We are also very eager to discuss different ways we can look at incentives for voluntary participation as well, by the industry.

SLIDE 13: WRI PROGRAM APPROACH

This is the research approach that we're taking. We're going to do this in kind of a phased approach with go/no go decisions after each of the three phases: the proof of concept, pilot and our field operational test. We're hopeful that today, opening up this dialogue broader on this program will help us have even stronger partnerships with the industry—both the motor carrier industry and the technology provider industry, as well as our state and local partners.

We are going to try to not do this in a vacuum either, such that the concepts and things that we're working on from the R&D side of FMCSA, are consistent and support ongoing activities within FMCSA, but also more importantly, outside of FMCSA, with Customs, DHS, a lot of the port programs, as well as our friends at the Federal Highway Administration.

SLIDE 14: WRI PHASE & SCHEDULE

This gives you a sense of the timing and the schedule of where we are. We just completed Phase I. We did a proof of concept test where we had very limited assets. Out there we had one location. We actually had four vehicles: we had a motor coach, a truck—I'm sorry, three vehicles. A motor coach, a truck, and a police cruiser, and also a fixed weigh station. We are now transitioning—and the stars represent the key in go/no go decisions.

We are now transitioning into our Phase II. Phase I was the fun part: Does the technology work, yes or no? We were very encouraged to see that it does work using existing off-the-shelf technologies and solutions. We are now moving into the more challenging phases where—let's include some more end users from the state enforcement community, as well as the motor carrier community and the telematics community. Let's include more vehicles, let's look at different technologies both to identify vehicles and to communicate with them. Let's get a good weathering of these different scenarios so that at the end of Phase II we will have a better understanding of key technical, a good understanding of what are fertile paths from a technical side and what are some preliminary guiding principles and procedures that are acceptable to law enforcement as well as the motor carrier industry.

If we get there, at the end of Phase II, we'll decide to go forward into a very large field operational test which would include multiple states, multiple weigh stations and mobile units and perhaps 50 to 100 motor coaches and trucks, maybe more, and really test out the IT back office networks as well, and really weather it and see: we know that our IT systems can handle 3 million inspections per year, but can they handle 170 million inspections that Mr. Hill mentioned earlier in the video clip, or perhaps double that amount?

So really looking to test out, do the IT systems work? Do we have acceptable security items in place for this data to protect the fleets, states and FMCSA systems from cyberattacks? Do we have good security protocol in place as well?

At the end of it, then we will make a decision whether it's viable to deploy or not deploy this idea. That's the overall approach of the three phases of the research program.

SLIDE 15: PARADIGM SHIFT

What we are talking about here—to kind of step back from all the technology, we are trying to have a quantum shift in thought and view of current safety operations and enforcement operations, both from the fleet side and enforcement side. This quantum paradigm shift such that electronic safety checks or wireless inspections, or compliance assessments or whatever we call them, would be so ubiquitous, that they be inspected as frequently as truck weighs are inspected. For instance, you go to truck stop, you see the scales, but you don't see other regulatory things there. We are looking to really make these electronic assessments so frequent that unsafe operators and vehicles will know they are going to get checked, and won't go out there. Which will then, we're hypothesizing, based on our data to date, would have a positive impact on safety in terms of reducing crashes. It would also level the playing field for the majority of safe and legal motor carriers out there to not have these crashes and all of the problems that crashes incur to safe fleets in terms of congestion and other hindrances to the free flow of safe and legal motor carrier transportation.

SLIDE 16: WRI PROOF OF CONCEPT TEST AND CMV TECHNOLOGY SHOWCASE

With that, we are going to now transition to discussing the Phase I activities. We did a proof of concept in eastern Tennessee. We got some great partnership from our friends in the State of Tennessee, Department of Safety and the Tennessee Department of Transportation. We demonstrated this wireless inspection concept along with other technologies on August 7, 2007, in East Tennessee. I believe there were a few people on the line that were at the event. This was part of technology showcase. And it also was an opportunity to establish a reusable roadside testing corridor that we did. This next clip is another video from our administrator, Mr. Hill, who is talking about some of the benefits of the technology.

VIDEO CLIP: MR. JOHN HILL, FMCSA ADMINISTRATOR, AT THE FMCSA SHOWCASE IN AUGUST 2008**John Hill, FMCSA Administrator:**

Well, any time you expedite a driver's time in a weigh station, and you reduce the amount of time they're having in inspection, you're going to have a driver that's happy. And what this will do is, this will turn a 45-minute inspection into whatever it takes to drive by as they go by the weigh station. So, I think it produces more productivity and efficiency in the delivery process. So drivers, I think, will really appreciate it.

SLIDE 17: WIRELESS ROADSIDE INSPECTION (PROOF OF CONCEPT)

Now we're going to transition into describing and discussing what we demonstrated. After we do that, we are going to open up the phone lines, and have our Q&A session, so the lecture is almost over. You don't get to hear my voice, at least for a little while; you get to hear Gary Capps, who is my lead technical person, my lead test engineer from Oak Ridge National Lab. I am going to turn it over to Gary.

Gary Capps (Oak Ridge National Laboratory):

Thank you Jeff.

My name is Gary Capps; I work in the Heavy Vehicle Safety Research Center at the Oak Ridge National Lab. For those of you that are not familiar with Oak Ridge or ORNL, we are one of the seven Department of Energy labs scattered across the United States, and one of our primary missions is energy research. FMCSA approached us in the Fall of 2006 to consider developing a system that would determine the viability of collecting and transferring data wirelessly.

The slide that you see on the screen at this time is from the August 2007 showcase event and the data that we transferred at that event. And leading up to the event in our wireless proof of concept test was vehicle identification data, carrier identification data, driver identification data, and also vehicle status and driver status. In developing the technology we wanted, of course, to save as much time and resources as possible, so we partnered with PeopleNet, a mobile communications and onboard computer provider, to help us develop the system that would be used in the proof of concept test to generate the safety data message set. We also worked via contract with TechnoCom, a wireless transceiver provider, to transfer the SDMS off remotely, wirelessly from the vehicle.

During the proof of concept test, as Jeff mentioned, there were three vehicles involved, one being a Tennessee Highway Patrol cruiser, and then two test vehicles that we leased, and one was donated by a partnership. We used a 2005 class 8 Freightliner tractor and also a 2002 MCI motor coach for the testing.

We used both 5.9 GHz and 2.4 GHz frequencies to wirelessly transfer the SDMS off of the vehicle. These transceivers that were used are compatible equipment, that is, are compatible with the equipment that's currently being used as part of the vehicle infrastructure integration initiative for passenger cars. During the POC, and we will look in more detail about the safety data message set, but I wanted to tell you that during the POC we transferred data from these test vehicles, the test tractor and the motor coach, both statically, as if they were to pull into a weigh station and be inspected, but also at ramp speeds bypassing the weigh station and also at main line speeds, driving by the weigh station at highway speeds.

Data was also transferred to the mobile enforcement vehicle, the police cruiser, with it in a static position, sitting alongside the road, but also at highway speed while the test vehicle was moving at highway speed. We also took this equipment and installed it briefly at a weigh station in Kentucky, or actually a couple of weigh stations in the state of Kentucky, and demonstrated the successful formation and transfer of the safety data message set as we did at weigh stations in Knoxville, Tennessee and Green County, Tennessee, as well.

SLIDE 18: WRI POC SDMS DATA ELEMENTS

I'll go to the next slide and show you—we talk about this safety message data set; Jeff has already given you some of the elements that are involved there. You see on this slide that we have driver information as a first area; we have carrier information; we have vehicle information. We also have vehicle weight. One of our partners in the proof of concept test was Airway, who

many of you, I am sure, are familiar with have an onboard weighing system. We used that technology to weigh the vehicle, post it to the J1708 data bus, and then it was formatted and became a part of the safety data message set. We also monitored the J1708 data bus on the test tractor and looked at the ABS flags.

Medical card information was a part of the safety data message set. This was available by being entered by the driver at the beginning of the test series. The annual inspection data, same way—the FMCSA annual inspection data, the same way was hand entry, if the sticker information and the number, again, were available. One of the key features that we were asked to include in the system that we developed, of course, would be hours-of-service. We'll see a grid log in just a moment of that.

Other items from the data bus were also collected: odometer readings, also GPS information and also, of course, vehicle identification information. The lower right-hand side corner of the screen that you see, the items that are in green, we interviewed FMCSA field staff, and also enforcement officers from the states of Kentucky and Tennessee, asking them what types of data that they would like to see in an inspection system. We have tried to include in the proof of concept test in the safety data message set everything folks asked for. The items that you see there in green are the things we included by simulating back office computer systems. These were not resident on the vehicle, nor were they transferred wirelessly, but they were in a pseudo database at the roadside and in the mobile enforcement vehicle. What we were doing was simulating a query to back office systems, state and federal, looking up this information, and then displaying it to the officer.

SLIDE 19: GRAPHICAL INTERFACE—OVERVIEW TAB

On the next slide that you see, this is actually the graphical user interface that was developed by the Oak Ridge National Lab in order to display to the enforcement officer the safety data message set, or the data that's contained in the safety data message set. For instance, when the motor coach or the test tractor were inspected, immediately the enforcement officer would see driver information, and to the right of that you'll see carrier information. The ISS score for the vehicle is shown. In this case, there are violations shown, but that was the purpose, to show that this vehicle would have some problems. The vehicle information shown—there's also an alerts field that comes up, and in this case you see the ISS score of 84. This driver's license has been revoked and there's a vehicle registration problem. The Airway weight data is also shown in the overview screen. The graphical user interface that we developed has drill-down capability to get to more of the SDMS data. You see the tabs along the top; you have the ability to look at specific driver information, carrier information, vehicle information and also hours-of-service.

SLIDE 20: GRAPHICAL INTERFACE—DRIVER TAB

We will take a quick look at those screens now. This is the driver drill-down screen. Again, you see some detailed license information, medical card information and also hours-of-service and inspection history.

SLIDE 21: GRAPHICAL INTERFACE—CARRIER TAB

Moving to the carrier screen, we have the operating authority, proof of insurance and then again the ISS rating.

SLIDE 22: GRAPHICAL INTERFACE—VEHICLE TAB

Next we see detailed information; I am actually trying to use the tabs. Next we see the vehicle information.

Again, what you saw in the overview screen—the general information on the vehicle; a little bit more detail on the weight, total weight, also steer, drive and trailer weight, the last federal annual inspection information. You actually see the IFTA sticker with the number and a map of the Continental United States showing the states in turquoise that this particular vehicle is apportioned for, and there are seven states. You see the ABS flags and in this case we saw no errors during the testing; so those are all off.

Engine and tire information was not collected for this particular vehicle.

SLIDE 23: GRAPHICAL INTERFACE—HOS TAB

The last screen that the officer could see would be detailed information about hours-of-service. You see a typical grid log with the totals for the day, and also the 70 hour, eight-day ruling and the six hour, seven day information are shown.

I am not able to move ahead at this point. We're going to watch a quick video now, and then we'll look at the results of the POC.

Jeff Loftus (Transportation Specialist, FMCSA ART):

Gary, do you want us to start it?

Gary Capps (Oak Ridge National Laboratory):

Yes.

VIDEO

In this video, you are going to see the test tractor from the August 7th event passing by the weigh station in the bypass lane at low speed. Then you're going to see an image of the screen inside the inspection station that the officer saw that day. It's going to be populated with data from the SDMS. That's going to look just like what we saw earlier.

The next image that you are going to see is outside of—the man was parked around back of the inspection station, and queried the truck at the same time. Here the officer is actually drilled-down to the hours-of-service screen.

Now we see the motor coach coming through the inspection station, again in the bypass lane.

We will see the user interface update with data from the motor coach.

SLIDE 24: PRELIMINARY RESULTS OF THE POC FIELD TESTS

Currently the Oak Ridge National Lab is in the process of drafting a data analysis report and also a final report for the wireless roadside inspection proof of concept testing that we did in the summer. I can tell you, though, from the initial analysis and of course, obvious from the testing and August 7 event, that the system that was developed was able to format and transmit the safety data message set to the roadside, so the system worked as expected. The system was demonstrated at highway speeds to fixed and mobile sites. We were also able to extract the data elements as you saw to populate a user interface for the enforcement personnel to use. The other thing that's been alluded to, but we don't want to lose sight of, is the fact that we were able to capture these safety message data sets for use by back office systems, be they state or federal. As Jeff has mentioned earlier, a future goal of the program would be to use those in that way. There were issues, of course—nothing works perfectly. We've learned that more research needs to be done with the intent of placement of the types of antennas used, the orientation, and even cable lengths, to get effective and reliable transmission of the message data set to the roadside or the mobile enforcement vehicle.

I would like to thank our partners that participated. In order to move as quickly as we did and have the success that we did, our partners are to be applauded. PeopleNet came on board and provided hardware and engineering support in helping us format the safety data message set. Green Coach provided the motor coach that you saw in the videos and also driver and fuel. Airway Corporation provided the onboard weigh system. All of these partners participated at no cost to the government, and we appreciate that very much.

Some things that are available now that this proof of concept is finished: is the software to format and buffer the SDMS, to prepare it for transmission to the roadside now exists, and also the user interface to allow the enforcement officer to see the data in real time was developed by ORNL—that exists. And also, very shortly we will be issuing the data analysis report and following that will be the final report. I will turn it back to Jeff Loftus to now to talk about some of the other technologies shown on the August 7th showcase.

SLIDE 25: OTHER TECHNOLOGIES DEMONSTRATED AT SHOWCASE

Jeff Loftus:

Thank you Gary.

Just to kind of wrap up this portion, we also—at the showcase we were demonstrating other existing technologies. The first item, Commercial Vehicle Inspection System or ComVIS: that was a rugged PDA, personal data assistant, like a palm pilot-type device, that was built to military specifications that would be a hand-held device for inspectors as they're physically inspecting a vehicle, such that they would be collecting data electronically, and then sending the

message. Rather than keeping notes on a piece of paper and then hand-entering it into the inspection software, they would just click a button, and then the PDA would send it across the parking lot to their laptop. When they get back to the station, the inspection report would be printed and waiting for them to keep one file and give one to the driver.

We also demonstrated the existing system, the PrePass electronic screening system, which is at that site. PrePass is a deployed system that has been deployed for many years in 29 states with, I believe 300,000 participating trucks. I believe there are some PrePass people on the line, so when we open up the phones, if I get the stats wrong, I'll invite them to correct me. We demonstrated that technology.

We also looked at the Query Central Portal that FMCSA has deployed for our state partners. What this does is it's a way of making the connections to the different state and federal databases from roadside inspectors a lot more efficient and faster. In the past, if an inspector would want to check a driver's license, he would have to log on directly to the commercial drivers license system, but if they wanted to check carrier information, he would have to get out of that system, and then re-log on to another motor carrier management information system. This query central technology is a great upgrade in portal to provide service.

Another key tool that was demonstrated was our driver information resource, as well. For more information on drivers that go across the different carriers.

We also demonstrated the installed performance based brake testing device at the new inspection pit that was installed at this weigh station in eastern Tennessee along I-81. It is about 70 miles east of Knoxville in Green County, Tennessee.

We also demonstrated a very innovative smart infrared inspection system which builds on the success of the IRIS system, the Infrared Inspection System. What this prototype is looking to do is to have an automated assessment of the heat signatures that would come off of a motor coach or a truck, and provide a hit against software and safety rules in the software, and notify the inspectors in time that there's a safety condition or a thermal condition that's unsafe from a particular vehicle, looking at both wheel end issues, as well as other heat issues with the vehicles.

These are some of the other technologies that were demonstrated. If we have some time later on in the call, we have some slides and some video clips of that we could call up. If not, my contact information is going to be provided and I could follow-up with you individually with that information.

SLIDE 26: WIRELESS ROADSIDE INSPECTION SYSTEM: MAJOR USES OF SAFETY DATA MESSAGE SET (SDMS) INFORMATION

Just to sum up the lecture section of the morning, I wanted to revisit the slide on the major uses of the wireless roadside inspection system: How are we going to use the data, who is going to use it, and why? A key item to keep in mind is what Gary demonstrated and mentioned: we demonstrated this information going by staffed weigh stations or with a police cruiser driving behind the truck and the information being downloaded. I think a key force multiplier benefit

would be to, in addition to the 3 million targeted physical inspections, to look at automated inspections at bypass routes or at remote locations, to really level the playing field and change the paradigm such that we can really get better information and more information on the performance of drivers and vehicles and fleets. I believe that having this more information would provide a more accurate picture of the safety status and provide the necessary deterrents for unsafe operators to not go out on the road and put themselves and the general public at risk. Again, the other users would obviously be—the safety message set would be sent to the fleets, participating carriers, and owner/operators as well, and then the other users there.

SLIDE 27: DISCUSSION QUESTIONS

With that, we're going to transition into the discussion question section, but before I call on the operator to release the lines, I wanted share with you the four slides that I have to help guide the discussion.

SLIDE 28: QUESTION 1. WHAT ARE YOUR INITIAL THOUGHTS AND IMPRESSIONS REGARDING THE WRI PROGRAM AS A WHOLE?

We have 70 minutes before the line goes out, but there are four basic questions that I have to start this discussion. Your thoughts and impressions of this program, with some of these teaser questions below. Do you think we are on the right track? Do you think we are really not on the right track?

SLIDE 29: QUESTION 2. DO YOU SEE ANY INITIAL BARRIERS OR CONCERNS THAT MUST BE OVERCOME?

Secondly, another key area, are some barriers and concerns that we need to overcome from a federal standpoint, state standpoint, and industry standpoint.

SLIDE 30: QUESTION 3. WHAT CAN WE DO TO ENCOURAGE (MAXIMIZE) VOLUNTARY DEPLOYMENT?

The third item would be ways to encourage and maximize voluntary deployment of these systems. I am going with the working assumption that we are not going to mandate this technology industry-wide. That's kind of the working assumption that I have from my research standpoint. We are looking for ways to make incentives to this approach.

SLIDE 31: QUESTION 4. HOW SHOULD WE ENGAGE THE MOTOR CARRIER INDUSTRY AND OTHER STAKEHOLDERS AS WE MOVE FORWARD?

Lastly, how we can really engage the industry, both the motor carrier industry and the telematics technology industry, and other key stakeholders.

In that light, I want to make an announcement. We are going to be holding a two-day meeting, open to the public, and targeted at the stakeholders to discuss technology capabilities that would support this program. We are looking to host this meeting in Washington D.C. or the surrounding areas on January 17 and 18, 2008, (Thursday and Friday). That's the Thursday and Friday of the Transportation Research Board week. We are still finalizing the exact location, but more details will be posted on our Website as well to make you aware of this event. I would invite any and all interested parties, but primarily the technology providers, to come and to discuss their capabilities such that we are as smart as we can be when we start designing these systems and we start making some choices on what we want to evaluate in this next phase. I want to evaluate as many viable approaches as we can so that we come up with the most cost-effective solution at the end which would be the most deployable one as well, I would think. Since cost, cost to industry specifically, is a key Go/No Go decision parameter that we need to be appreciative of, and recognize.

With that, let's go back to the first question here and I will invite the operator to give her instructions.

QUESTIONS AND ANSWERS

Kirse Kelly: At this time, if you would like to ask a question you can submit questions in the **Q&A box** which is on the left side of your screen, or if you want to ask questions over the phone, you can press * 1, state your name. When your line is open, Leanne, our phone operator will announce you by name. State your name clearly for her. The questions will be answered in the order that they are received. A favorite question of people is: "Will a copy of the presentation be provided?" Yes, that will be provided after the discussion and you will be able to download that to your computer.

Jeff Loftus: Leanne, are you still with us?

Leanne: Yes, I am.

Jeff Loftus: Have you opened up the lines?

Leanne: They need to press *1 in order to ask a question and no one has queued up yet.

Jeff Loftus: Okay, that's fine. We've got a number of written questions.

Question: *How is the data privacy insured during wireless download?*

Jeff Loftus: Excellent question. We didn't really focus on that for the proof of concept. I would say that is a key item as we go forward—to make sure that the proper security schemes and protocols are in place. It is something that we will evaluate. I will invite Gary Capps or Val Barnes on the technical side to also speak to that question.

Gary Capps: I can say for the proof of concept the data we were transferring was not real data, there was nothing sensitive in it, so in the proof of concept we did not address security data transfer issues and we purposefully stepped over that to go ahead and validate the viability of the concept. Clearly, as Jeff said, that will be addressed and needs to be addressed, in bringing the right people to bear. I don't know, Valerie, if you have anything to add.

Valerie Barnes: Just that during the pilot that is certainly an objective.

Gary Capps: Yes.

Jeff Loftus: I was mistaken—I read the last question rather than the first. The first question:

Question: We operate Qualcomm HOS; this data is transmitted real-time relative to every vehicle in our fleet with permission from fleet operators. Why not access their database and monitor HOS? We would want some benefit though—we operate legally, but some of our competition does not.

Jeff Loftus: I think that's an excellent suggestion. I think you are right in the sense that we don't necessarily have to have the communication paths go roadside-to-vehicle, vehicle-back-to-roadside. It could be roadside-to-vehicle and then the vehicle notifies their service provider or their carrier that state X wants a message set from Y vehicle, and that information is sent from the service provider to the state and FMCSA. That's a key communications path that we are going to evaluate, because it would minimize cost. We don't necessarily have to use roadside transponders if it was more based on coordinates and the like. So that's something we are considering, something we need to look at—and we are planning to look at this other communication path, because one of the guiding principles that we have for this next phase is looking at the cheapest viable solution to the fleets and obviously at existing deployed systems.

We are trying to come up with performance specifications, not design specifications. We are really focused on giving the fleets and the technology providers the "what," in terms of what we want and how fast we want it, what size it is, how frequent it is, and then let the smart technology people and operations people at the fleets deliver solutions that meet those performance specifications.

Question: Do you envision the system being able to work with all EOBRs? If so, will it be the burden of the producer of those EOBRs or FMCSA to make sure those communicate?

Jeff Loftus: Yes. Based on my earlier comments, we would have the working—basically, the requirement, or the goal, I should say, that the performance specs would be flexible enough that any EOBR provider could meet them.

Whether or not the burden of the producer to make sure those communicate—I would say from my research standpoint, that the burden would probably be on the manufacturer to meet the specification. I say that—and I am not a regulatory person here at FMCSA, but based on my understanding of the current voluntary requirements we have for self-certification by automatic onboard recording device manufacturers or AOBDRs, the manufacturer has to self-certify that the device meets our requirements under 49 CFR 395.15.

Question: *I think more information is needed on the carrier cost to outfit trucks and what the productivity return on investment is for safe carriers.*

Jeff Loftus: Some of that information is in the research report. We looked at the benefits. The cost to the fleets would be—we estimated to be—\$500 to \$900 per truck. We looked at the benefits and there's key safety benefits of the scheme, looking at our assumptions and the like in the research report, but I think we need to do more though. I completely agree with you. That was Dan Murray. I completely agree with you that we have to do more on the productivity side.

In fact, I'm not going to read who is writing the questions in, so we can be as candid as possible. Since we are recording the vocal part of this call and no one has signed on to say anything vocally, I get the sense that anonymity is something that people want, and so I will infer that that's the case, and honor that by reading the questions, not who asked them, in the interest of having even more candid and directed questions.

Do you have any callers in the queue, any vocal questions?

Leanne (Operator): There is no one queued up from the phones at this time.

Question: *Note that the pending legislation to give tax breaks for deploying technology mentions the installation of brake stroke sensing.*

Jeff Loftus: Yes, there's a bill being discussed that was recently introduced for tax incentives for onboard safety equipment. I just read the press releases. I'm not directly involved in that effort. I believe that the Commercial Vehicle Safety Alliance was a key sponsor of that. I don't know if other groups are involved. I believe some of the technologies were onboard collision avoidance systems and the like—lane tracking systems and what have you.

Question: *At what speed were the vehicles traveling in the August test video? Are you working toward a particular speed?*

Jeff Loftus: Gary, I'm going to turn that one over to you.

Gary Capps: In the bypass lane, in the video you saw, for the motor coach and the tractor, those were 25 mph. We also, of course we maintained legal speed limits in all of our tests. I can tell you in the Knoxville area we were traveling at 55 mph, and I believe in Kentucky we may have gone 65 mph. Please, if you are a

Kentucky enforcement officer and you are listening to this, we obeyed the speed limits, but we did test as high as 65 and also in the static mode. I'll add that with the mobile enforcement vehicle, we went on a 150 or so-mile trip and just let the systems free run, and speeds vary there from 45 to 65 mph with both vehicles in motion.

Jeff Loftus: If I could just elaborate on that, that's where Gary—they had a van, a white van that had the same equipment as our police cruiser, and they drove in and around the participating truck during the test, driving alongside the truck for many miles, doing the downloads. We learned a lot of interesting things about antenna placement, I tell you.

Question: *Is it possible to recover the vehicle configuration data? This would be valuable to the safety community: vehicle miles traveled by vehicle type.*

Jeff Loftus: I won't say who asked that question. Unless the person wants to hit *1 and say, "I asked that question." Gary, why don't you take that one?

Gary Capps: The answer is yes. That information is in the safety message data set—if I am understanding the question correctly. It is actually, or would be, in a Phase II test, and for our test, in fact, was stored and could be parsed and used in that way, absolutely.

Question: *How do we eliminate the resistance by both industry and some governmental agencies to place transponders on either the license plate or the windshield? How do we monitor these in the vehicles and do the corrections needed in a system of several states?*

Jeff Loftus: Those are my performance objectives for Phase II. I think we need to get some good field data and really have independent evaluations of good field data from a technical standpoint and a cost standpoint. I think if we have good and generally accepted independent field data on these questions that'll help on the key decision-makers who may be reluctant to change the status quo or to change the current paradigm. How do we monitor these vehicles and do the corrections needed in the systems in several states? I think an air correction, tracking, and diagnostic controls are key items, because if there's no faith, and if there's no confidence in the system, it won't be used by law enforcement and it won't be used by motor carriers. We clearly have to focus on these very important procedural and basic issues, in terms of—I mentioned earlier how Phase I was the fun part in terms of bolting it together and letting it fly. Now we have to focus on, is this deployable, and how do we make it secure? How do we make it useful for very busy people at the motor carrier industry and the law enforcement industry, so that the information is reliable, accurate, timely, and has the confidence of those parties involved?

Question: *Can you reconcile the 64 percent cited on this slide against the crash causation study that show that accidents involving a large truck and a*

passenger vehicle that 50 percent of the time the passenger vehicle was cited as the critical reason?

Jeff Loftus: Yes. I included all of the crashes. Both crashes where another vehicle didn't exist—just a single truck crash—and I thought I mentioned when I discussed this, and perhaps I should add a bullet for future presentations, when you do look at the crash causation data involving trucks in one or more vehicles, that 56 percent number comes out, where the critical reason for the event is attributed to the non-truck or the other vehicle. I took the 46 percent and then added the population of the single-vehicle crashes. So, 46 percent of the time it's the truck in these types of accidents that you cite that is attributed to the critical reason, but there are a significant number of single-truck vehicle or truck crashes where it's just the truck that's running off the road and crashing as well. That's how we get to the 64 percent.

Question: Who provides all the software for an independent contractor?

Jeff Loftus: Let's see. I don't quite understand that. I am going to speculate that. The software that we created for this effort was paid for with your tax dollars, and so is therefore in the public domain. So anyone on the line that wants the software can have it, as well as when we scrub the report to make sure it's accurate, we will publish that as well. If that does not answer the question, please ask another.

Question: Is there a cost estimate for a typical tractor-trailer combination?

Jeff Loftus: We looked at just the tractor-based systems. Obviously, in the enabling technologies that we estimated in our research report—that's on our Web site. And maybe, Kirse, in the interim we could load up the research report for download as well, if that's possible, along with the presentation, to save folks a step. We really focused on just the tractor, the onboard recorder, and the two-way communication device, the transponder. Obviously, if you wanted to add more sensors to that, the cost would possibly go up. Technology cost is really a factor of volume, as well, and open standards, and deployed and using de facto standards and the like. We really just estimated that current EOBR—electronic onboard recorder—costs and the current cost for a transponder—the ones that we used were in the \$50 range, but transponders can be very cheap, they can be just about a dollar, if they are the passive types of transponders that are attached to a windshield. That only gives you vehicle-specific data; that wouldn't give you driver-specific data connected to that transponder, but there are multiple schemes of mirroring up of data and the like that we look to evaluate in the Phase II effort.

Comment: Great program, but a voluntary, not focused on unsafe carriers.

Jeff Loftus: I think that was a comment. This is a very timely item here in terms of: "Should it be voluntary or should it be mandatory? It's currently a key item in

our rulemaking to update the current onboard recorder requirements. Our approach will be to keep both items on the table so we have data on both, and ask those types of questions when we get together with the fleets, carriers, and other stakeholders on January 17 and 18 (2008).

Question: *How do you envision capturing or addressing trucks that pass through an inspection point without transmitting data?(i.e. the driver that removes transmission devices or interferes with transmission to avoid detection)*

Jeff Loftus: That's a key question that we need to focus on. I think that it is a reality that, for instance, the last thing a speeder will do is put a light on their truck or a car that says "I'm speeding, everyone." So it's a key risk approach that we'll have to evaluate. I don't have a good answer for that. I think it's something we're going to try to address in the next phase. It is a reality that we can probably expect and I will throw it out to Valerie or Gary on the technical side. Let's say that they had a device, but they turned it off. What would be your comment, Gary, or Val?

Valerie Barnes: This is Val. I would say that they're in the pool of people who are not participating, so they don't realize the benefits of having data collected to show that they're safe and legal so they may get pulled over.

Jeff Loftus: Right.

Gary Capps: This is Gary. Jeff, you can stop me if I go too far here. In the planning for the Proof of Concept testing we kicked around a lot of these same questions, because we were trying to understand how to attack this. It's fairly straightforward to have a screening device at a weigh station to look at trucks. Let's just say that it were mandated for all vehicles, so if you didn't have it on your truck and you somehow are cheating. It's very straightforward to screen the vehicles as they come through the weigh station or any other area and query them for transponders. I don't think that's an insurmountable problem, but I don't deny that it may happen.

Jeff Loftus: Thank you. I believe that is something that's going to be a key item as we forward, to really focus on because it has to be a reliable system that we can use and feel comfortable with, that it will improve safety.

Question: *Could some of the back office software be made available to carriers for use at their own operation centers?*

Jeff Loftus: Definitely. We're going to be working with carriers, either in Phase II or Phase III; we're still sketching those decisions out. Whatever we fund with public dollars will be available in the public domain for carriers to use—to take and tweak, and modify for their own use. One of the key products of this effort is to make all of the software and the specifications that we have, that we develop for these concepts available to perhaps minimize cost and accelerate deployment.

Question: *How secure will this system be? Will there be any possible way that anyone can tamper with the WRI?*

Jeff Loftus: We are going to try to make it as secure as possible, but really try and take a layered approach to that. It's really an issue of—this concept, these onboard recorders or the transponder, the current enabling technologies we are talking about, need to be part of a larger enforcement approach, as well as a data quality approach on the carrier's side, to minimize the tampering of this data, and also to have some independent data feeds that could then be collaborated to identify where there are errors in the system. We're going to really work on that and really have it as part of a broader layered approach with independent data feeds coming in—supporting documents, those types of things—so that we minimize the tampering with. Also on the enforcement side, have penalties high enough so it would be a deterrent. That's just some initial thoughts on this—but an excellent question.

Leanne, is anyone in the queue for an oral question?

Leanne (Operator): We have a question from Tom Kearney.

Tom Kearney: *Jeff, not so much a question as a comment. Tom Kearney, Truck Size and Weight Program, Federal Highway Administration. You are touching on incentives and what kinds of incentives for participation may be available. We will keep our eye on truck tolling programs and incentives that may be hitting the coast soon regarding financial ability to financially entice trucks to participate in programs such as this. The ability—turning off the system equals nonparticipation. It also gets linked to incentives. There's a relationship. What we saw in Germany a year ago in the toll-collect program was the inability to handshake with a roadside sensor meant nonparticipation, which meant you were going to be pulled in, and you were going to participate in a traditional, manual, time-consuming enforcement event. Time to the trucking community is much more valuable than money in a lot of cases. These three items, in terms of incentives, nonparticipation or disablement are not unrelated. Once again, down the road, we'll keep an eye on where we are going with truck toll lanes, the ability for trucks to buy their way out of congestion. There may be some incentive opportunities for participation through initiatives like that. Thank you.*

Jeff Loftus: Thank you, Tom. Excellent comments and I appreciate your perspective and your knowledge of the satellite based toll system that the German government has instituted for all the trucks traveling through Germany.

Is there anyone else?

Leanne: Again, to ask a question please press *1.

Question: *What is the current cost of the units and monthly fees for these units? Also are they open-ended systems that can be integrated into the current applications that we are running?*

Jeff Loftus: I'm going to hand that one to Gary and then perhaps invite anyone from PeopleNet if they're on the line to also take that question as well. Gary, what's your sense of that?

Gary Capps: I am glad you invited the PeopleNet folks if they are on the line. The systems that were developed for the Proof of Concept, keep in mind they are one-off devices sitting in the laboratory right now and they are not available because we were not tasked to build something that would be commercialized from the lab here, from Oak Ridge National Lab. I can tell you that the vision in the work that we did was that other types of technology providers like PeopleNet, their systems could be used or could be modified to be used. I say again there's no technology that exists to do this at this point, but we think it's plausible that providers that have technology out there and also fleets that have technology on their trucks, these technologies could be modified in the future to serve in this role. I don't know if Bryan can speak or not, Jeff—if he's able to come in.

Jeff Loftus: He can press *1 if he wants to.

Leanne, is there anyone else waiting to talk?

Leanne (Operator): Bryan McLaughlin's line is open and Randy Burrow's line is open too.

Gary Capps: Great, those are the guys we need to hear from.

Bryan
McLaughlin: Gary, this is Bryan McLaughlin from PeopleNet. I missed the beginning of the question so could you just repeat that and we'll do our best to answer it.

Question: *What is the current cost of the units and the monthly fees for these units? Also, are they open-ended systems that can be integrated into current applications we are running?*

Bryan
McLaughlin: Yeah, the PeopleNet onboard system is roughly about a \$1000 in terms of its cost, and monthly fees really vary based upon the applications and such, but can be anywhere from \$20 per unit per month all the way up to \$50 per unit per month. That obviously includes a lot of other things beyond just the wireless inspection component of this which again, is in proof of concept stage. As far as open systems, I can just speak to our system. Ours is very much an open architecture with APIs for the onboard, but also from a back office perspective. That was one of the things we really were able to thrive in the proof of concept was that because of the open platform we could send data

to the TechnoCom box or to other systems within the cab and that's obviously going to be a requirement going forward.

Jeff Loftus: We had kind of a working approach for this entire program to use commercial off-the-shelf technology as much as possible. As I mentioned earlier, specifying the performance specifications would be a key product of this whole research program, so that smart people like Brian and his colleagues at the other companies that provide telematic devices can meet them. I just wanted to also echo Gary's earlier comments and really praise Brian and his team at PeopleNet for stepping forward and making this demonstration a reality. They were able to convert our message set and get working software in about two, three, four weeks, Gary?

Gary: Yes, approximately in a month, yes.

Jeff Loftus: I was just really impressed and really happy. Again, we're going to be inviting other providers of the same types of technologies, onboard recorders for fleet management purposes and hours-of-service recording. We really want to hear from you, as well. The door isn't shut on who the providers are by any means because we're not convinced there is a one-size-fits-all. That's why we are moving toward performance specs—so that all the different unique solutions out there can meet them. I would invite everyone again to plug our event on January 17 and 18 (2008) for that.

Leanne, anyone else on the line?

Leanne: There're no questions at this time.

Jeff Loftus: Okay. Well, we still have lots of other ones. Why don't you click to the next slide there, Kirse, so that they could see some of the barriers-types of questions that they could perhaps use as teasers, as well.

Question: *Will all states be required to use this system or will it be up to the state? How will uniform roll-out to all states be ensured so carriers that run in particular regions are about to avoid these systems?*

Jeff Loftus: The goal would be to have a unified system nation-wide with all the states. That's the deployment goal, but it's not going to happen overnight. We have a lot of work to do to prove that the system is viable for users at the state level, at the federal level, and also at the fleets. The goal would be to have a uniform system out there such that if you are legal in one state you are legal in all states regarding the message set information. That is one of one of our guiding principles, if you will.

Question: *If a vehicle is found by an unmanned virtual site to be in violation, how will the violation be handled?*

Jeff Loftus: Excellent question. We actually have some thoughts on that question in our concept operations document that we've drafted. It's also touched upon in the research report we did a few years ago for this program. Basically, we have some working thoughts on this, but nothing really specific at this point. Again, it's going to be a key item for our next phase. The idea would be that the information would be communicated from the virtual site back to the state command center, for lack of a better term, and that information would then be logged for that carrier's record, and then uploaded to FMCSA systems. That's kind of the thought. Obviously, we would also check to see if there were available resources in the area if it was at an unmanned site and it was able to be interdicted upon.

Question: *Slide 20: In the proof of concept, the drivers entered their information. Moving forward will there be a validation process for the entry of the physical CDL or other information regarding the driver?*

Jeff Loftus: Gary, why don't you share with folks what we did for the POC because I thought that was an innovative thing that we didn't really touch upon.

Gary Capps: What we did for the POC was we had the folks, the engineers at PeopleNet, develop some special screens for us so it was a one-time entry. Basically, again, in some of our early conversations we had the thought that when a system would be installed in a truck, someone at the fleet level would come in and enter that data, maybe in a secure mode, so that the driver would really not be able to enter that. That was the method we used. Special screens were developed by PeopleNet. It was a one-time entry. From that time on, drivers were identified by the vehicle just by swiping their license. There really was no user input beyond that. Of course, user input was a license swipe or a duty status change. I don't know if that speaks to it like you want Jeff, or we could get Brian or Randy back on to give more information.

Jeff Loftus: Certainly we would need to have the proper controls in place. Whether or not it's a particular validation process or other information, we would have to have a technical approach in place that is workable from an operation standpoint for the fleets and also secure and validated from a law enforcement standpoint. How we would do that is something that we're going to be focusing on in the next phase. Clearly, I would imagine that we're going to have a validation process to convey that the data coming from the vehicles is accurate: the driver, driving that vehicle is that person.

Question: *Will Canada and Mexico participate when this is broadened?*

Jeff Loftus: I don't know the answer to that question. Possibly. We are not going to rule anything out, but like I said, we have a lot of work to do between here and getting the U.S. hooked up into the concept. In fact, I would recognize our friends and partners at the electronic screening systems that are out there—PrePass, NORPASS, and other states—it's taken them a good number of years

to build their infrastructure. There's a lot of work to be done. It's definitely a possibility, is all I can really speak to that.

Comment: *I have concerns of the State Department of Motor Vehicles not updating medical certificates in a timely fashion. Some cases over a year since recertified.*

Jeff Loftus: Okay. I think that's a key item that we'll take and move forward with when we have that data element and looking at the frequency of uploading data as we pursue the next phase. Thank you for that comment.

We're going to go to the third slide in terms of talking about incentives and things. A key thing I like to hear from the motor carrier industry on the line is what are some of the rules of engagement? What would it take to have the fleets voluntarily share driver, vehicle, and carrier information, with the state and federal enforcement officials? What would be the cost of doing that, I guess, in terms of what would you want back in terms of incentives from the states or the feds to allow that? That's something I would really like to explore and really get my arms around as the research person here. I'll just throw that out to get additional questions or comments on that.

Leanne—any callers waiting?

Leanne (Operator): Not at this time.

Question: *What is to prevent someone from marketing a system that always transmits a good report that isn't really related to the status of the vehicle and driver at all?*

Jeff Loftus: Excellent question. Gary, I'm going to throw that to you.

Gary Capps: Okay, I'll take a shot on that one.

In order to do that, it would be a fairly smart system, so there would be a fairly large cost associated with that, because part of the data being transmitted across is real-time speed GPS position. Again I reiterate, it would be a fairly smart system and I don't think the cost would be minor, so it seems like a lot of effort to go around. Again, I guess it's possible to be done. I believe, as the gentleman from Federal Highway had already stated earlier, there will be some query at certain points to validate systems and to ensure that the systems are on. If that's not—if those checks are not met, then you basically come into the weigh station for a regular inspection, but then also depending on what the legal situation is at that time that could be some other sort of violation.

Jeff Loftus: One thing to keep in mind is that this system would not be deployed in a vacuum. Right now, the states are deploying license plate readers at their weigh stations. States that have PrePass and NORPASS have protocols and

procedures in place to identify vehicles that travel past their stations without transponders and to jump into their trooper cars and track them down, intercept them. So there are existing solutions to the existing systems that are out there now. We would really look to build on their success and expertise, and partner with them, such that we can avail ourselves of their knowledge, having already dealt with these very same issues and challenges, to make their systems as efficient and tamper-proof or spoof-proof as possible.

Question: *If this program is dependent on the driver to input some data before the trip starts, how can correct data be guaranteed?*

Jeff Loftus: Wow, I love the candid questions here.

I would say we would have, like I mentioned earlier—technologically, we really want the driver to enter the data into the devices because the alternatives would have cameras in the cabs or heat sensors in the cabs, or sensors on the drivers. I'm going to go back to my earlier comment, which is the fact that we would have a layered approach and have a broader enforcement program such that these non-compliance patterns could be identified and interdicted upon in terms of use of supporting documents. I am going to pick up on Gary's earlier comment that maintaining multiple electronic log books rather than multiple paper log books is more difficult, if you really wanted to try and to break the systems. It's a key question that we will be continuing to evaluate in our next phase. I think that going back to the other comment from Tom Kearney of Federal Highway, the incentives to do that may not be there in terms of being subject to the regular enforcement programs and the like. It's a key item that is on our radar screen.

Comment: *FYI, broad data access does not necessarily reassure carriers because of litigation disclosure issues.*

Jeff Loftus: Well, broad data access—I'm not sure what was meant by that term, but maybe it's a security issue. Let me frame it this way, the data that we've collected and we are planning to further demonstrate and transmit is not any new data that is not currently required under our regulations. Our working assumption, or our plan I should say, is that the data would only be sent to authoritative sources and authorized users, meaning state law enforcement, FMCSA and the particular motor carrier themselves or their agent as a service provider. We would look to experts in the technology industry that have deployed fleet management systems for service providers or the larger fleets that have telematic solutions on how they are securing their systems, such that the information is secure.

From a litigation standpoint, my sense is that perhaps we can bring this up when we meet in January (2008). There is a concern, I believe, that you're sharing in this comment, that if we collect it then it could be accessible via court proceedings, so it may not be beneficial to collect it in the first place. I

think that's a key and valid point we need to consider and evaluate that risk which would be a barrier to participation by the fleets and see what remedies exist for that issue. I appreciate the comment on that. I think I understand it. If I don't, please call in and further elaborate on your point.

Leanne, is there anyone waiting to talk?

Leanne (Operator): At this time I'm showing no questions.

Jeff Loftus: That's fine. I would rather have candid questions and input than attribution.

Question: *I apologize; I joined late due to technical problems. Does the wireless roadside inspection program plan on doing license plate scanning and DOT number scanning? If so, DOT number scanning—is there any problem with the equipment reading the numbers of the truck?*

Jeff Loftus: We're going to look at the technology that's being deployed, and we're not going to rule it out. There are some serious limitations though on that technology, though when you compare it to using a transponder-type device. With the transponder-type device for a radio signal, you don't have to contend with snow or dirt obscuring numbers on a plate, or different fonts and locations in different colors on the side of a truck with the DOT number painted on it. It's still on the table, and we'll evaluate it, but I really think there's been a lot of work done over the years by the states and their technology providers for a fully automated license plate reader approach. I think it would be used as part of our layered approach perhaps, as a way to get independent data perhaps as a way to identify someone that has falsified their electronic books, if you will.

Question: *Are there already security requirement targets set for the system? How will you ensure the information transmitted is accurate and not manipulated?*

Jeff Loftus: We do not have any specific requirements or targets set at this time outside of the fact that we are going to make it secure according to existing federal communications standards that we follow already today for transmitting information wirelessly from our inspectors to our back office systems. We are going to start there with our CIO's office and look at our security requirements and then also engage the telematics providers, the technology providers that provide these solutions for other existing standards. This is not an area that I know a great deal about, but there's been, obviously, a wealth of work done since we have deployed systems out there for both federal and state partners and the fleets.

Leanne, is there anyone on the line?

Leanne (Operator): We have a question or comment from Drew Schimelpfenig—go ahead.

Drew Schimelpfenig: I can only respond to your question about encouraging voluntary deployment. I'm curious as to whether there's been any progress made prior to provide incentives to customers, to the shippers, for those shippers that decide to use carriers that are participating in voluntary EOBR programs or a voluntary WRI program.

Jeff Loftus: To be honest with you, I hadn't thought of that. I think it's an interesting idea, and we will consider it. I am aware that some of the larger shippers have their own self-certification type programs in terms of the carrier has to meet certain procedural standards, ISO 9000-type standards in able to haul freight for a particular company. It's an excellent concept to put on the table. Thank you.

Now I'm going to go to the fourth slide, other ways that we can encourage the industry, as well as our key stakeholders from academia, from the safety groups, from the motor coach industry, the trucking industry, state enforcement, and our other federal partners at Homeland Security, including Customs and the like, as to how we can best engage stakeholders in the most productive way and get some good weathering of our concepts.

We have, I believe we have the e-mail addresses of all the folks that registered?

Kirse Kelly: Yes, we do.

Jeff Loftus: There's another document, the concept of operations document for this program that I want to share with you. I'm not sure we will be able to pull it up for download today, but we will e-mail that to you. A lot of the concepts are written down there. I really encourage you to comment on that, so that we can design the system in a way to be most effective from a safety standpoint, but also most deployable from a cost standpoint.

Question: Have the industry participants for the pilot phase already been selected?

Jeff Loftus: No. An industry participant would be—I am taking that in the broad sense to be motor carrier participants, as well as technology industry participants. We have not done any selections. Right now we're in the planning stages. We want to get as smart as we can as to current capabilities from a technology standpoint, but also operational issues from our folks in the motor coach and trucking industries. That will be some of the key items that we'll be looking to gather information in our January 17 and 18 (2008) meeting. No decisions have been made for the pilot phase.

Comment With regard to incentives, has any consideration been given to providing tax breaks or credits to our customers and shippers that use carriers that are participating? Not suggestive that this would replace any potential incentives for the carriers, but would be in addition to.

Jeff Loftus: That was the caller's other comment and it is noted here. Tax breaks—it's something that's beyond the scope of our authority here at FMCSA, but it is something that's being considered based on the new bill that was introduced for onboard safety technologies that's currently being discussed. I believe I read about it in the trade press. It's on the table for incentives to carriers and we will consider this incentive for shippers as well.

Question: *With the current cost of doing business in fuel, how do you see the extra cost not being transferred to the consumers?*

Jeff Loftus: We are hopeful that the return on investment really is there for the fleets through other efficiencies. Also, by reducing queues and not having the trucks slow down, that would have environmental benefits as well. It is a key consideration in our cost-benefit analysis we will be doing as we proceed in this program. We did some initial looks, and initial swags on that question that you will see in the report that we are going to put up for download in our initial research. Clearly, we need to do more in this area, so we have good data and get the support of the trucking industry to participate in this program.

Comment: *Possibly offer incentives as state license fee, vehicle registration fee reduction.*

Jeff Loftus: Thank you for that idea. We have it logged. If we went the license plate route with a transponder approach with the DMVs, that would also be with that as well, as a way to equip the trucks with these identification devices.

Question: *How will the system know which driver was operating which vehicle?*

Jeff Loftus: That information would be communicated. Like we mentioned before, if a vehicle was detected of not communicating the accurate data we would have some interdiction strategies. We would also have to have some collaborating data points to be collected, so we can ensure that it wasn't spoofed—perhaps not so much at the roadside level, but perhaps more at the carrier level. That's something we recognize as a key issue and really is a great comment we will take and put our arms around in this next phase, because, like I mentioned earlier, if it's not reliable, if it doesn't have the trust of the law enforcement community and the motor carrier community of being secure, accurate data, then it is not a system that's deployable or should be deployed. We are very keen on that and I appreciate the comment.

Comment: *Other incentive idea: rebates to carriers to help recover the cost of database integration.*

Question: *How is it planned to articulate the wireless roadside inspection program with the EOBR rulemaking? Is there already a common time schedule?*

Jeff Loftus: I believe the schedule for the EOBR rulemaking is available on the U.S. DOT Regulatory Site; I don't have that date in mind. If someone on the line who is

tracking that closer than I am knows it, feel free to write in the comment with the date. Obviously, to answer the question, though, this program is keeping a very close eye on the program. In fact, the message set that we used in the research program is very similar to the appendix to the rulemaking in terms of the message set. It's not a one-for-one comparison, but it's pretty much a guide that we used in this demonstration project. I think we would follow the key policy and agency directions from the rulemaking as it relates to the deployment of this program and make sure that it's in sync, because clearly for this program to be successful, it has to have a direct correlation and direct connection to the regulatory rules, or the regulatory requirements that are out there. It can't be an island. I would say that one is going to take its lead from the other. We are going to take our lead from the EOBR rulemaking.

There are a lot of unknowns, but clearly our research effort, since we think an EOBR would be required from a research standpoint to convey a lot of the hours-of-service information, that it would be connected to the rulemaking.

Question: *The concept would update company safety status and driver safety status. Does this mean that the inspections would be integrated in real time in SAFER and SAFESTAT?*

Jeff Loftus: That's our goal—is to have the data coming out of the system feed into our existing FMCSA and state databases and software systems. That's why we're working very closely with our colleagues at the CSA 2010 program, as well as our existing technology systems IT department within FMCSA. We are not doing this research program in a vacuum. They are onboard with this effort and are fully engaged with where we are going. We are using a lot of the same data that they are already uploading. We are just doing it at highway speeds.

Question: *Questions posed by the participants today were excellent, as well as your answers. Will these be forwarded in written form to the participants?*

Jeff Loftus: I don't know the answer to that. We will have to get back to you on that one. I would like to have a script, as well, so we don't lose any of them.

Question: *Can you provide some more detail on the scales that were used for the POC, the proof of concept?*

Jeff Loftus: Yes, I'll invite Gary to say that, because we didn't use any scales in the roadway. They were used onboard the vehicle.

Gary Capps: Those were manufactured by Airway Corporation and I believe you could actually just type "Airway" on Google, Google it and they'll come up. It's an onboard system that looks at the air pressure in the airbags—it has to be a vehicle that has air suspension. That was used on the tractor and trailer.

Jeff Loftus: They also provided all their equipment and expertise for free to us as well. A great partner.

Comment: *To sell this idea to industry, I think reputable carriers would accept the program as doable if there could be shown time and cost savings (i.e., any paperwork reduction, cost savings, fuel cost savings, reduced starting and stopping, time savings, maintenance costs, etcetera).*

Jeff Loftus: That's a key item that we want to pursue in the next phase.

Comment: *Engage state trucking associations, commercial driver's license school associations, etcetera, to encourage participation.*

Jeff Loftus: Thank you. Excellent ideas, and we really appreciate your insights on that.

Question: *Would insurers not be a natural partner for incentive route to discount carrier costs?*

Jeff Loftus: I think that's an excellent idea. My limited experience and discussions with insurance—our office used to do some stakeholder sessions in years past and we had some insurance companies on the line. They are more interested—my last talking with them a few years back was the perspective that they were not interested in evaluating technologies. They were more interested in risk reduction, whether you're using technology or not, and do you have a multi-year, or a proven positive trend towards improvement of safety as a real driver for them. But I think it's definitely, in addition to the comment earlier about shippers, we definitely are going to put them on our radar screen. We definitely want to put insurance companies for the fleets on the list of stakeholders to invite, because, who knows, the world may have changed a lot since we last spoke to that particular group. That was two, three, four years ago. Thank you for that comment.

Comment: *Regarding the question on how the system will know which driver is operating it: The technology exists to have a magnetic card as a CDL and a card reader on the vehicle.*

Jeff Loftus: Right, that's what we did.

Comment: *When the driver gets in the vehicle he/she would have to put his/her CDL in the card reader before the vehicle could be started.*

Jeff Loftus: Clearly, there are technological solutions to do that. I believe that there's some personal identification number schemes, as well, that could be used. We looked at some of those technologies when we did our hazardous materials security and safety op test a few years back. That's an excellent idea and suggestion for a technological solution for that.

Any other questions on the phone for the group?

Leanne (Operator): I have a question or comment from Tom Kearney.

Tom Kearney: Number one—I would like to applaud your fortitude and your stamina. It's been quite a show and you've carried quite a load here for the last two hours. I applaud that.

Jeff Loftus: Thank you. I'll be sending you a check in the mail.

Comment (Tom): On that subject regarding incentives for participation. There seems to have been a recurring theme regarding financial incentives: discounting of taxes, or any kind of fee applied to commercial motor vehicles. I just want to remind everyone right now the health of the trust fund is something of keen interest to our policymakers. I am sure if Motor Carrier Safety Administration coming out of box with any recommendation that could be seen as having adverse impacts on the health of the highway trust fund may be challenged. It may be a challenging road to get through the financial control parties in the federal government.

Once again, Jeff, you did touch on this. The more effective approach from the enforcement standpoint, one of the most effective enforcement views in Europe is time is money to the trucking community. To be able to do in-motion safety certifications, vehicle inspections, weight measures and even dimension scanning—the envelope of the commercial vehicle itself on the fly. The more automation that can be tied to those kinds of measurement activities, that is time that is very valuable to the trucking company.

Manual inspections are slow, they create congestion, delay, they create air quality problems and they also cost the trucking firms money. I would point to the greatest incentive, for what is trying to be accomplished here, may be pointed toward more efficient, more effective enforcement program delivery.

Jeff, once again great show—congratulations to your whole team.

Jeff Loftus: Thank you Tom.

We've got another question, but before we go there, we have called up the poll again for folks that may have gotten on late. We have four basic questions, just some basic demographic questions. It is completely anonymous. I would like to invite folks, if they haven't already, to please answer these four quick questions, as to what type of organization are you representing today? If you are a carrier, what kind of carrier are you? If you are a carrier, what kind of technologies do you currently use?

That will help us with a flavor of the group that is interested in this topic, so I invite you to do that. We will call up the download screen, as well, very soon.

I will keep going as long as there are questions. I had a very big breakfast, so I don't really need lunch. I mean that, seriously. I had some delicious blueberry pancakes. We can keep going forward if you'd like.

Another question...

Question: *Is this program part of CVISN?*

Jeff Loftus: CVISN, for folks that may not know on the line, stands for the Commercial Vehicle Information Systems and Networks Program. I am very fond of this program, because I spent 10 years of my life working on it. The answer is yes. It is a program that is being deployed nationwide. It includes electronic screening systems, uploading safety inspections and government electronic credentialing systems for buying permits or paying fuel tax or vehicle registration. It's being deployed by the states and the states are in different levels of deployment. Clearly, we don't want to create this program in a vacuum. It would cost us twice as much, and it wouldn't be as successful. It would cost twice as much, take four times longer and it would make the same mistakes, or challenges, or deal with the same issues that folks had already solved years ago. So, clearly, we want to build on the work the CVISN or the Commercial Vehicle Information Systems and Networks Program have deployed. It's a \$25 million a year grant program to the states to deploy these systems to improve safety and efficiency for the fleets. We are clearly going to build on this and really look to the partners that are actively deploying CVISN both at the state level and their service providers, such as PrePass, NORPASS, and Oregon Green Light and other states that have electronic screening systems to see if we can partner with them on this program where we will be focusing on additional data items.

Are there any other questions? Either on the phone or written in?

Leanne, any other phone callers?

Leanne (Operator): There are no questions at this time.

Jeff Loftus: Okay. We are going to—again, I'm going to put a plug in for our data gathering meeting or our capabilities meeting, request-for-information_type meeting, on January 17 and 18, 2008 here in the District, or the D.C. area. We are trying to put it close to an airport, either in Crystal City by National Airport or perhaps out at Ashburn near Dulles Airport, to make is convenient for folks who are not going to be already in town for the TRB. It would be a two-day meeting, business casual.

I would really love to continue this dialogue with the very insightful commenters both from the motor carrier industry—our friends in the trucking industry, motor coach industry, as well as the very smart and, quite frankly, brilliant, technology people on the phone, and also the folks from the safety groups and academia who bring their unique perspectives to bear on this, as well, because we really need to make this program a win/win for all of the stakeholders. I really want to applaud your participation on the line today, with your insightful comments. Thank you very much.

Real quick, also, if you wouldn't mind doing a quick evaluation before you download for this webinar—four basic standard questions that we'd love for you to fill out, and then we will sign off. Look for our announcement on our homepage for the event on January 17 and 18, 2008. I will also e-mail you details for that meeting directly since I have your email addresses from this call. I am going to investigate putting on *fedbizops.gov* as well.

Is there anything else here Kirse?

Kirse Kelly: Yes, you can download the presentation, as well as the WRI report. They will be up here for the next couple of days, so if people ask about them you can send them to this site, enter as a guest and download them.

Kirse Kelly: Jeff, what was the report you were saying that people could get—what is it called?

Jeff Loftus: We're going to send you the Concept of Operations document that describes more of the procedural things in a lower level of detail, that's more of a current document. The research report that you are downloading is—I guess we wrapped that up earlier this summer. A lot of the data collection was a year prior to that. This third document, the Concept of Operations document for the wireless roadside inspection program, where we'll be talking about—really in detail, how the data would work, technology solutions, those types of things. It's an opportunity to send us comments on that. I will e-mail that to the folks on the line.

Kirse Kelly: What we'll do is, I am going to put the information up here, you can send an e-mail to FMCSA Host. That's where you registered. If you are interested, we will reply and send you the report.

Jeff Loftus: Any other questions or comments?

Not hearing any, again, we're going to leave the materials up for you to download today and tomorrow. Send us an e-mail if you want to have the Concept of Operations or Con-Ops document sent to you. We would really love your feedback and hope to see you at TRB on the 15th, 8:00 a.m. to 12 p.m., and at the follow-on to this call, the technology discussion—capabilities discussion—on the 17th and 18th, Thursday and Friday of January 2008.

With that, I'm going to sign off, thank you all for participating; have a good rest of the day and week.