



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

## OFFICE OF ANALYSIS, RESEARCH, AND TECHNOLOGY

### IntelliDrive Safety Applications for Commercial Vehicles January, 20, 2010

#### Webinar Transcript

##### Presenters

- Jon Mueller, General Engineer, FMCSA Office of Analysis, Research, and Technology (ART)
- Brian Cronin, General Engineer, Intelligent Transportation System Joint Program Office (ITS/JPO)
- Alrik Svenson, Research Engineer, National Highway Transportation Safety Administration (NHTSA)
- Tom Kearney, Transportation Specialist, Federal Highway Administration (FHWA)
- Rick McDonough, Program Manager, New York State Department of Transportation (NYSDOT)

##### Speakers

- Kirse Kelly, Web Conference Coordinator, FMCSA ART

##### **Description:**

The U.S. Department of Transportation's (DOT) IntelliDrive<sup>SM</sup> program is focused on advancing connectivity among vehicles and roadway infrastructure in order to significantly improve the safety and mobility of the U.S. transportation system. The IntelliDrive Program is a major initiative of the Research and Innovative Technology Administration's Intelligent Transportation Systems Program, in collaboration with many organizations throughout DOT, including the National Highway Traffic Safety Administration, the Federal Motor Carrier Safety Administration, and the Federal Highway Administration. This webinar will provide an overview of the IntelliDrive program, as well as more detailed information on the research plans for Vehicle-to-Vehicle and Vehicle-to-Infrastructure safety applications specific to commercial vehicles. In addition, there will be discussion of the establishment of an IntelliDrive Commercial Vehicle Safety Working Group, envisioned to include vehicle equipment manufacturers, suppliers, fleets, researchers, and other stakeholders who are interested in participating in the research, development, and deployment of IntelliDrive Commercial Vehicle Safety Applications.

PRESENTATION—INTELLIDRIVE SAFETY APPLICATIONS FOR COMMERCIAL  
VEHICLES

PRESENTATION TITLE SLIDE: INTELLIDRIVE SAFETY APPLICATIONS FOR COMMERCIAL  
VEHICLES

**Jackie (Operator):**

Welcome and thank you for standing by. At this time all participants are in a listen-only mode until the question and answer period. If you would like to ask a question at that time, please press star, then one (\*1). Today's conference is being recorded. If you have any objections, you may disconnect at this time. I would now like to turn the meeting over to Ms. Kirse Kelly. Ma'am, you may begin.

**Kirse Kelly (Web Conference Coordinator, FMCSA ART):**

Thank you, Jackie. And thanks to all of you who are participating in our webinar today about IntelliDrive and the Safety Applications for Commercial Vehicles. Today is Wednesday, January 20, 2010. This webinar is part of a series put on by the FMCSA Office of Analysis, Research and Technology in conjunction with a lot of other groups at this time. Now, just to warm you up on a few things: as Jackie mentioned, time permitting, all questions are going to be answered at the end of the call. You can submit questions in the "Q&A Box" which is on the lower side of your screen, or you can submit them at the end of the call, hitting \*1, and asking the operator to put you through. Once again, that is only at the end of the webinar. Please note, you are going to be given an opportunity to download the presentation at the end of the webinar. If you have to leave early, you can still return to this Web site or go to the FMCSA ART Web site at a later time and the slides will be available.

Members of the trade or local media who are participating today are asked to contact the FMCSA Office of Communications at (202) 366-9999 at the conclusion of the webinar if you have any questions.

Finally, for anyone who might have problems seeing—and this meeting room might be pretty small—you can just go to **Meetings** and click **Manage My Settings**, choose **Full Screen** and that should help you out and get your screen a little bit larger.

Now let me go ahead and turn you over to Jon Mueller who is a General Engineer here at the FMCSA ART Technology Division. Jon?

SLIDE 2: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Thank you, Kirse. Welcome everyone, and thanks for participating. As Kirse mentioned, FMCSA is hosting today's webinar, but IntelliDrive is really multimodal effort involving the

agencies that you are going to hear from today. We will hear from different agencies as it relates to particular commercial vehicle safety. As we said, we have 90 minutes today and should have plenty of time for questions at the end.

#### SLIDE 3: OVERVIEW OF INTELLIDRIVE

As you can see, we have organized our discussion as follows. We have speakers from the ITS Joint Program Office, NHTSA, Federal Highway, as well as the New York State DOT. Let's get started. Our first speaker is Brian Cronin with RITA's ITS Joint Program Office. Brian is the team lead for IntelliDrive research and will give us the overview of IntelliDrive. Brian?

#### SLIDE 4: OVERVIEW OF INTELLIDRIVE

##### **Brian Cronin (General Engineer, ITS/JPO):**

Thank you, Jon. I am glad to be here with everyone today. IntelliDrive is part of the ITS strategic research plan which we just completed, working with the modes across the department. That document is available on our Web site, on the front page, [www.its.dot.gov](http://www.its.dot.gov). And for those wondering, it is the document called the *Executive Summary of the Strategic Plan 2010–2014*.

#### SLIDE 5: OVERVIEW OF INTELLIDRIVE

IntelliDrive is really about safety, mobility, and environment, and then the technology and policy underpinnings that move the program forward.

#### SLIDE 6: OVERVIEW OF INTELLIDRIVE

We are RITA, which is where the ITS Joint Program Office is, working collectively with Federal Highway, Federal Motor Carrier, NHTSA and Federal Transit Administration to bring getting to a point of decision on deployment related to IntelliDrive.

#### SLIDE 7: INTELLIDRIVE<sup>SM</sup> IS CONNECTIVITY

What is IntelliDrive? That is really our definition of looking at how we connect vehicles, drivers, wireless devices, and infrastructure to improve surface transportation. We are looking at how do we share information to better manage the system, provide safer driving environments, and provide more connectivity and mobility for travelers.

#### SLIDE 8: IT'S ALL ABOUT CONNECTIVITY

When we talk about connectivity, if you look at a wireless infrastructure that would be able to provide payment, deliver safety messages, deliver messages from the infrastructure such as traffic signals, to delivering and collecting probe data which you can do now with cellular type

technology, to using other types of technology for different kinds of probe data. Collecting that information and then making it available for those that can use it either at a management center level from a public agency, a management center from a private transportation provider, or the private sector in terms of traveler information, as well as at the vehicle level between vehicles for active safety and management.

#### SLIDE 9: COMMUNICATION METHODS

So, what do we mean by “Communications” in IntelliDrive? At the heart of it, it is dedicated short-range communication using the 5.9 GHz spectrum that was allocated to us by the Federal Communications Commission. We are dedicated to using DSRC at 5.9 for active safety. It is the only communications technology that meets the requirements that have been defined as necessary for active safety, which means low latency, secure interoperable communications. With that said, there are other wireless communications—Wi-Fi, WiMAX, 3G cellular, 4G cellular in the future—that could be used and IntelliDrive encompasses using those communications where they make sense. We will be looking forward to the commercial vehicle industry to help us identify what requirements are necessary related to wireless communications for the different elements of the program.

#### SLIDE 10: WHAT CAN INTELLIDRIVE<sup>SM</sup> DO FOR YOU?

So, what does it mean for you? Jon and others are going to get into a lot more detail on specific commercial vehicle items. Broadly, on the mobility side, it is being able to take a whole host of data that we don't currently have available to us, and make better management operational decisions to manage the system, to provide information and choice, and overall performance management of the surface transportation system.

From the environment, we feel that there is the opportunity to better understand the environmental data that is available off of a vehicle that we can use to look at environmental strategies that might reduce emissions, save fuel, and help us environmentally.

Finally, from the safety perspective, how do we reduce and eliminate crashes? Through advisories, warnings and potential active safety control to increasing drivers situational awareness about icy roads ahead, blind spot and curve warning-type issues, and so forth.

That is a very high level overview. The ITS Joint Program Office is working collectively with each of the modes, trying to put together a program that will help us answer some critical research questions related to “Is IntelliDrive ready for deployment?” —meaning: “Are applications available that would provide benefit; are those applications feasible to implement; do we have the technology underpinnings to do it safely/securely, and certification related to communications and data exchange?” And then, “Do we have the policy and institutional framework to implement that the public will approve and that we can move forward?”

With that—that is sort of a very high level. We have just completed the planning and arrangement within the department, and we are now starting our—continuing really—our outreach coordination as we look to implement this research program.

Jon, I will hand it back to you.

SLIDE 11: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Thanks Brian, I appreciate it.

SLIDE 12: INTELLIDRIVE FOR COMMERCIAL VEHICLES

I just want to talk a minute about IntelliDrive specifically for commercial vehicles and what we are talking about today in regards to the safety part of it.

SLIDE 13: INTELLIDRIVE FOR COMMERCIAL VEHICLES

The safety applications are designed to increase that situational awareness, reduce or eliminate crashes through that communication, whether it is vehicle-to-vehicle, or vehicle-to-infrastructure. We are looking to support the driver advisories, driver warnings, vehicle, and/or infrastructure controls. Specific to the commercial vehicles, we want to develop and evaluate these safety applications that can incorporate the unique needs and the vehicle dynamics of large trucks and motor coaches, since collision with a vehicle in transport is the first harmful event in 75 percent of all fatal crashes involving large trucks. That is according to the *2007 Large Truck and Bus Crash Facts* that the agency put out.

Examples of those applications I think we are familiar with the vehicle-to-vehicle side—things like forward-collision warning, blind-spot detection, lane change/merge, and the “Do not pass, blind spot” type of warnings.

Vehicle-to-infrastructure—we have several that we think about when we talk about V2I: intersection safety, roadway departure, run-off-the-road prevention, and then some overarching Smart Roadside that involves other parking programs, automated enforcement, the wireless roadside inspection effort, and things of those natures.

SLIDE 14: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

So, for a little bit more detail on the vehicle safety side of it, Alrik Svenson is a Research Engineer in NHTSA’s Office of Applied Vehicle Safety Research, and he will give us more details related to the V2V research plan.

**Alrik Svenson (Research Engineer, NHTSA):**

Okay. Thank you, Jon.

## SLIDE 15: INTELLIDRIVE VEHICLE TO VEHICLE SAFETY APPLICATIONS RESEARCH PLAN

Today I would like to talk to you about the IntelliDrive vehicle-to-vehicle safety applications research plan. I would like to go over, basically the elements of this plan and give you, a good feel of what—the research that we are doing in this area.

## SLIDE 16: VEHICLE TO VEHICLE COMMUNICATIONS FOR SAFETY

So, what is vehicle-to-vehicle communications, or V2V?

We define it as “The dynamic wireless exchange of data between nearby vehicles that offers the opportunity for significant safety improvement.” V2V will allow for each vehicle on the road, including passenger cars, motorcycles, heavy trucks, buses, and transit vehicles to communicate with other vehicles, and this rich set of data and communication will support a new generation of active safety applications and systems.

## SLIDE 17: V2V SAFETY RESEARCH PLAN GOALS

A research plan has been developed for advancing V2V safety. The goals of this plan are: employing V2V wireless technologies that can mitigate a significant portion of the crash problem; establishing standards for DSRC, which as Brian just pointed out, is currently the only available wireless technology in the near term that offers the needed latency, accuracy, and reliability for active safety applications. Finally, the plan will accelerate technologies that will ensure there is a value for early adopters of V2V so that it is not a roadblock to implementation.

## SLIDE 18: RESEARCH OUTCOMES

The V2V safety plan has been developed to have the following research outcomes: a determination of the potential safety benefits of V2V technologies; development of practical, DSRC-based, V2V active safety applications. Some examples of these, as Jon just touched on, are forward collision warning systems, emergency brake light warnings, blind spot and lane change assistant systems, and other driver assistance technologies. The plan will address the technical issues related to security, scalability, and positioning by developing standards and protocols in each of these areas. We will develop a driver-vehicle interface that will address and minimize distraction and driver workload. The plan will accelerate the adoption of V2V for all vehicles by developing aftermarket and retrofit solutions. And finally, we will compile all of the needed information to support the NHTSA regulatory decision in 2013.

## SLIDE 19: V2V SAFETY APPLICATION RESEARCH TRACKS

The V2V research plan is organized in tracks to address all of the major research areas.

In Track 1, we identified the critical crash scenario framework for V2V. Some of the applicable crash types include rear-end crashes, intersection crashes, head-on, lane change/merge, backing, and loss of control crashes.

In Track 2 we ensure interoperability and determine the supporting infrastructure needs for V2V deployment. Safety applications must work across all equipped vehicles, regardless of type or vehicle make and model, and also must adhere to a level of communication standards to ensure security and message integrity.

In Track 3, we will develop rigorous estimates of the safety benefits of V2V. This includes the development of performance measures, objective test procedures, as well as validating the safety benefits.

In Track 4, we will develop prototype active safety applications, and evaluate these through objective tests and field trials.

Track 5, Driver Issues: we will develop effective driver-vehicle interfaces. The effectiveness of collision warning systems rely on the effectiveness of the quality of the interface with the driver, so these interfaces developed need to reduce driver workload, and not cause an additional distraction that can reduce the driver's performance.

Track 6: we will investigate policy issues such as security, privacy, enforcement, and Government, and also will formulate the regulatory decisions. This track will also coordinate within the context of the broader IntelliDrive program to address these issues.

Track 7, on commercial vehicles, will develop heavy vehicle specific safety applications and I will be presenting more details on the specifics of this plan in just a minute.

Finally, in Track 8, we will develop transit-specific applications because adding automotive-safety applications to transit vehicles has the potential to provide significant benefits to the transit industry.

#### SLIDE 20: V2V SAFETY APPLICATION RESEARCH PLAN

This is the roadmap for the V2V safety research plan over a 5-year timeline. These are more specific details on the activities in each of the tracks I just described, and each of the blue boxes in the plan represents specific research tasks. You will notice there is a Track 0 on this diagram which refers to some current research related to IntelliDrive, which is carried over from previous NHTSA programs. I would like to point out Track 7, the commercial vehicle track, outlines the general V2V research for heavy commercial vehicles, and I will be giving you more details on that in just a minute.

Also, I want to point out—there is a milestone for a NHTSA regulatory decision on the plan in 2013 for V2V and, on this figure, is listed on Tracks 3 and 7. Also, you may have noticed, Track 8 on transit is missing from this figure. This track has only recently been added to this plan, and is not shown in this picture, but the plan for this track is now being developed as we speak.

## SLIDE 21: TRACK 7 COMMERCIAL VEHICLES

We have developed a more detailed plan specifically for Track 7, commercial vehicles, with the following goals. First, the plan needs to be responsive to the specific needs of the heavy commercial vehicle industry and its stakeholders. And second, to conduct research to address the technical and policy issues that are impeding the accelerated deployment of V2V for heavy commercial vehicles. The Track 7 plan is organized similarly to the overall V2V plans with sub-tracks to outline the major areas and milestones.

## SLIDE 22: COMMERCIAL VEHICLE V2V RESEARCH TRACKS

These are the sub tracks of the commercial vehicle V2V plan.

Track 7a is the crash-scenario framework and this will, similarly as for light vehicles, determine the V2V applicable crash scenarios relevant to heavy vehicles.

On Track 7b, we will be developing the heavy vehicle safety applications and determine the overall benefits of these systems.

Track 7c will investigate heavy vehicle specific interoperability issues; for example, things like communications between passenger vehicles and trucks, and antennae-height effects of commercial vehicles.

Track 7d will explore commercial vehicle specific human factors and driver issues including, the special driver workload requirements of commercial vehicle drivers, and ways to address in-cab distraction.

Track 7e, planning and outreach, includes a number of meetings and workshops to coordinate with stakeholders, and communicate the progress of the research.

Finally, Track 7f, on policy, is mainly a coordination track with other parts of IntelliDrive.

All of this work is leading up to a NHTSA regulatory decision in 2013.

## SLIDE 23: CV V2V SAFETY APPLICATIONS RESEARCH PLAN

This is the timeline for the commercial vehicle V2V safety research plan. The majority of the effort will be in Track 7b, and will involve developing commercial vehicle specific applications, building prototype vehicles, conducting testing, and determining the safety benefits.

You will notice that there is a lot of coordination with the other parts of IntelliDrive in this plan, especially with the light vehicle activities, since many of the issues involved are exactly the same for both light vehicles and heavy commercial vehicles.

Like I said, all of this work is in support of a NHTSA regulatory decision in 2013. I would like to point out that there are numerous opportunities in this plan for industry to partner with DOT along the way in this effort to accomplish these important safety goals.

## SLIDE 24: SUMMARY

In summary, NHTSA, in cooperation with other USDOT modal administrations, including FMCSA, FHWA, and FTA have begun research on V2V communications for safety as part of the IntelliDrive program. V2V has the potential for significant safety benefits for all vehicle types and classes. Both NHTSA and FMCSA are conducting research on commercial vehicle V2V to support regulatory decisions on these systems in 2013. I would like to add—there are many opportunities for industry to work with DOT on this to achieve these safety goals, and we would really like to hear from you.

With that, I will turn it back over to Jon.

## SLIDE 25: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Great. Thank you, Alrik. Next on the agenda is Tom Kearney. Tom is a Transportation Specialist in the Federal Highway Administration's Office of Freight Management and Operations. Tom is going to provide a look at the vehicle-to-infrastructure portions of IntelliDrive as it relates to commercial vehicles. Tom?

SLIDE 26: INTELLIDRIVE<sup>SM</sup> CVO/ FREIGHT VEHICLE TO INFRASTRUCTURE OVERVIEW**Tom Kearney (Transportation Specialist, FHWA):**

Thanks Jon. As we heard earlier as Brian was giving the overview, the aspects of commercial vehicle, or vehicle-to-infrastructure, vehicle-to-vehicle communications coordination have a lot of different compelling aspects with regard to productivity, mobility out of the network, safety enhancement, benefits to the environment—protecting our environment.

My talk is going to focus in on CVO freight with respect to the Office of Freight that I work in, in Federal Highway, but I did want to go back and underscore a couple of points that Jon made regarding the very important initiatives underway—the V2I—vehicle-to-infrastructure for safety. The research plan is under development, under discussion right now. The timeline is very, very similar to what Alrik—actually, they are very well coordinated with the timelines of the roadmap that Alrik shared with us today on the vehicle-to-vehicle safety for very good reasons. We need to coordinate. Within the research plan, once again—multimodal. JPO, our Joint Program Office facilitated the coordination of discussions among Motor Carrier Safety Administration, our NHTSA Office, the National Highway Traffic Safety Administration, the Federal Highway Administration, and the Federal Transit Administration. When we talk commercial vehicles, it is trucks and buses.

## SLIDE 27: V2I–CVO/FREIGHT

The vehicle-to-infrastructure aspect, especially with regard to the safety aspect, Jon touched on this—Jon Mueller—in his discussion regarding intersection safety, and including signal lights, signal priority and timing, the run-off-the-road prevention—the vehicle being aware of where it is on the road, and when hazards with road geometry—curvature, both horizontal and vertical—are presenting themselves, and in that last bullet that he touched on, was Smart Roadside.

The Smart Roadside Initiative has a history. This is not a new initiative. I know a lot of participants today have been hearing about Smart Roadside over the past few years. It is a joint effort Motor Carrier Safety launched a few years ago, and Federal Highway has joined Motor Carrier on automating enforcement activities. Automation of enforcement activities have a lot to do and play a very big part of the roadmaps for the vehicle-to-infrastructure safety roadmap, as well as the safety and mobility roadmap for crafting for CVO freight within the overall IntelliDrive programs.

I do not want to give everyone the impression that enforcement is the only aspect. Although it is an important one linked to safety, there are other safety aspects that are also tied to the CVO freight vehicle-to-infrastructure framework. They would include—and I am just going to flip the slide, but you can see down on the bottom where a couple of the bullets address that.

## SLIDE 28: ROADSIDE PROGRAMS/PROJECTS COORDINATED VIA SMART ROADSIDE INITIATIVE

A very busy bubble chart here, where I get to announce some acronyms and explain them to you. The Commercial Vehicle Information and Services Networks [*Editor's note: Correction—Commercial Vehicle Information Systems and Networks*]; the Cross Town Improvement Program; CLARUS, a Latin word for “clear,” the Roadway Wet Weather Information System that Federal Highway is sponsoring; the USDOT truck parking programs. Not only the SmartPark program—Motor Carriers’ investigation into technology-based solutions to the truck parking problem—but also the 1305 program under SAFTEA-LU that Congress put out where Federal Highway is advancing major projects on the East and West Coasts at this time.

Various bubbles here have to do with the public-private partnership as we spin around, looking at roadway information systems coming to the driver, wireless inspections, tracking of inventory, virtual weigh stations—a very busy chart here on Smart Roadside to address a problem facing the nation in the short and longer term.

## SLIDE 29: RECURRING CONGESTION: 2035

That is just one of our standard, stock congestion maps Federal Highway Administration’s Freight Office uses to bang home the point that the importance of automation, the importance of programs like IntelliDrive—vehicle-to-vehicle, and vehicle-to-infrastructure initiatives to make smarter highways—in the face of the challenges we are going to have very shortly regarding mobility. As you can see, it’s creeping across the Country by 2035—a lot of congested corridors. Without getting into too much detail into any of the bullet points or highlights that I just touched on, I am going to hand it back to Jon Mueller because our next speaker has much, much more

compelling stories to tell; much better examples of how vehicle-to-vehicle safety within the truck realm is being delivered.

Thanks, Jon.

SLIDE 30: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Thank you, Tom—appreciate it. Next on the agenda, we will hear about an example of commercial vehicle IntelliDrive that is actually in place and working. Rick McDonough is with the New York State DOT's Office of Modal Safety and Security. He is the Program Manager of the Commercial Vehicle Infrastructure Integration Project and is going to highlight the activity of that effort. Rick, go ahead.

PAUSE

SLIDE 31: COMMERCIAL VEHICLE INFRASTRUCTURE INTEGRATION A.K.A. COMMERCIAL VEHICLE INTELLIDRIVE

**Rick McDonough (Program Manager, NYSDOT):**

I am Rick McDonough. As Jon mentioned, I am the Program Manager for the CVII Project, also called Commercial Vehicle or Heavy Vehicle IntelliDrive. This has been a program that has been—we have been working on from concept to initiation probably for about 2½ –3 years.

SLIDE 32: COMMERCIAL VEHICLE INFRASTRUCTURE INTEGRATION (CVII) PROGRAM

Once we looked at the initial Vehicle Infrastructure Integration program, which was the previous name of the IntelliDrive program, we looked at it, and noticed that one component that was not being addressed was heavy vehicles—commercial vehicles. With cooperation, partnership, and support from the I-95 Corridor Coalition, we received funding to start addressing that aspect of 5.9 GHz technology. We had a couple of goals—one of goals was to make sure that this led to a completely interoperable system. That is really the beauty of the IntelliDrive or the 5.9 GHz technology arena, is that it really addresses some of the problems we have seen in the past with other types of technology, particularly in the ITS field. And a perfect example of that is transponder technology, where you need different transponders, even though they are all operating at 915 MHz frequency, to do border crossings, or to do tolling, or to do screening for commercial vehicles either at weigh stations or electronic screening systems. That is really one of the benefits of this technology. Also, we wanted this technology to integrate with the databus of a commercial vehicle—and that is really the “brains” of the vehicle systems. Fortunately, the heavy vehicle industry is much more advanced and more standardized in those systems, so it is a little easier to deal with it across manufacturers and across the industry.

We started the project May 2009. The agreement was actually executed in February 2009, but it took us a couple of months to mobilize. We had a competitive process, and the team led by Volvo Technology of America was selected. Part of the team members includes Booz Allen Hamilton and Southwest Resource Institute in Kapsch. The point being here, these are firms with rich experience in prior VII and 5.9 GHz technology development and applications. We really have some of the leaders in the country, and it's a very, very strong team.

It is currently a 2-year schedule in the first phase which is under contract now, and we are probably going to beat that schedule. We will probably be completed with the first phase of activities by the end of this year.

As part of this effort, we also established a CVII advisory team with all of the representatives from the major Federal, State, and industry representatives, including Joint Program Office, FHWA, Federal Motor Carrier, State agencies both within New York State and outside of New York State, and trucking industry representatives—ATA, ATRI, and New York State Motor Truck.

#### SLIDE 33: CVII PROGRAM—PHASE 1

The current phase that is underway now is to basically create the hardware and the software needed on the vehicle to provide the basic communication link between the vehicle on the roadside, and from vehicles-to-vehicles. The first step in that phase is completed.

A couple of weeks ago, we went down to North Carolina and saw both vehicle probe information being generated and information from the roadside in terms of signage conditions being sent to the vehicle.

The other Phase 1 activities that are underway at the moment include driver identification or verification. That would include a device in the cab, either some kind of TWIC (Transportation Workers' Identification Credential) card, Smart Card reader, and/or biometric reader that would identify the driver and allow that information to be sent to the roadside through the network, either to the operator, or the carrier, or enforcement to verify that that driver is in fact capable of operating that particular vehicle. If that is the case, everything is fine; the vehicle can be started, can be driven. If not, the vehicle will not start; it will not be driven.

We also are looking at wireless vehicle safety information from the databus. That would include things like light status, seatbelt status, brake status—again, for fleet management purposes; for enforcement purposes. Lastly, we are going to start some vehicle-to-vehicle work. That would be specifically having a commercial vehicle and a maintenance vehicle—a plow truck—in New York State being able to communicate with each other, and particularly the plow truck—the maintenance vehicle—broadcasting its position—broadcasting its operating condition—such as plowing a construction site, etc.

## SLIDE 34: CVII PROGRAM—PHASES 2 AND 3

We are also in the middle of negotiating—actually completing negotiations on a second phase for this effort. The second phase would deal with some additional heavy vehicle, and in this case, to light vehicle, driver safety warnings. I will talk about that in a second.

We have just received funding for a third phase of this effort. That phase will deal specifically with making the 5.9 GHz technology interoperable with existing 915 screening and virtual weigh station operations. All of this, again, is being funded by I-95.

## SLIDE 35: CVII PHASE 2: 1. V2V ENHANCED ACTIVE SAFETY

Specifically, on the second phase of this effort, on the vehicle-to-light vehicle safety applications, we will be looking at some of the same applications that were mentioned earlier today: potential blind-spot warnings to drivers—and this would work for both the commercial vehicle and the light vehicle—hard braking events, and tailgate warnings.

## SLIDE 36: CVII PHASE 2: 1. V2V ENHANCED ACTIVE SAFETY

We are also looking at some more applications that would be useful in rural environments, such as “safe to pass,” where the truck would monitor conditions, monitor positions, and broadcast with a trailing car whether it is safe to pass or not.

## SLIDE 37: CVII PHASE 2: 3. ENHANCED ACTIVE SAFETY (SAFE TO MERGE)

We will also be looking at “safe to merge” information, a very similar scenario: a vehicle overtaking another vehicle, making sure—particularly if it is a tractor trailer—they are giving the tractor trailer enough room based on the conditions, the speeds, the environment, etc., and giving the driver an indication of whether it is safe to merge back into the lane.

## SLIDE 38: NYSDOT LONG ISLAND EXPRESSWAY INTELLIDRIVE TEST BED

This next slide is a map. It is part of our ongoing 5.9 activities in New York State. We have 26 roadside installations along our I-495 Long Island Expressway. That system is operational today. It was used in November 2008 to do a demonstration of about two dozen different applications of VII/IntelliDrive for the 2008 World Congress, the ITS World Congress.

That certainly helped seed this project. It gives us a test bed that is open for anyone to use, whether it is to test hardware or applications. We will be bringing the completed products from our CVII effort, and demonstrating them within this corridor, probably in 2011.

## SLIDE 39: NYS INTELLIDRIVE/CVII CORRIDORS

We are also in partnership with other State agencies, including the New York State Freeway Authority. This summer, through some mutual actions, we will be installing 14 additional roadside units on the toll road, I-87, that leads to and from the Tappan Zee Bridge over the Hudson River.

As you can see from this overview, the yellow line is the existing Long Island Expressway Corridor with 5.9 coverage. The green will be the new corridor, and we have proposed funding and we have plans to fill in the gaps, and connect those corridors. That would be at key portals, key bridge and river crossings, and other key locations. This is really kind of a business plan or a strategic plan for us on how we want to move forward on the infrastructure side.

## SLIDE 40: KAPSCH/NYSDOT/NYSERDA COMMERCIALIZATION OF AFTERMARKET 5.9 GHZ DEVICE

Obviously, a key part of this is getting the devices inside the vehicles. Another activity we are looking at, we are partnering with Kapsch in our New York State Energy Research and Development Authority to help develop and commercialize an aftermarket 5.9 device. This would be a device that would connect to the databus that could use Bluetooth technologies, to use an existing PDA or Smartphone as the driver interface for the communication.

This also, I think, gives us an opportunity to deal with and address some of the driver distraction issues, which is also part of this effort. As part of the basic development and research, we have asked the Volvo team to look at existing research and activities in driver distraction, and really try to get our hands around that looming issue for us.

Let's see—and with that, I will turn it back over to Jon.

## SLIDE 41: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Excellent, that's great Rick. Good things happening up there in New York. Before we get to the questions part, Alrik is going to go over the commercial vehicle working group that we are looking to put together.

And, just as a reminder, if you want to submit a question, it is in the lower left-hand corner of your screen. We will get to those as soon as we finish. Alrik?

## SLIDE 42: INTELLIDRIVE COMMERCIAL VEHICLE WORKING GROUP

**Alrik Svenson (Research Engineer, NHTSA):**

Thanks Jon. After hearing all about IntelliDrive for commercial vehicles, you are probably thinking to yourself, "How can I get involved?" If this is you, you are in luck, because I would

like to tell you about the establishment of the IntelliDrive Commercial Vehicle Working Group which is now just getting underway.

#### SLIDE 43: INTELLIDRIVE COMMERCIAL VEHICLE WORKING GROUP

DOT invites all interested stakeholders in the industry to work with the Department on the major areas of IntelliDrive. These include, as Brian pointed out at the beginning, safety, mobility and environment.

For safety, we envision the group will include vehicle manufacturers, OE suppliers, safety researchers, trucking fleets, and other end users of the technology.

We also welcome your comments if you think there are other groups or individuals we should be working with in this area. Please let us know if you know of some others. This is your opportunity to get involved and contribute to the research, development, and implementation of IntelliDrive. We plan to have separate subgroups for each of the specific areas, such as V2V, V2I, etc.

#### SLIDE 44: COMMERCIAL VEHICLE INTELLIDRIVE WORKSHOP

DOT will be holding a commercial vehicle IntelliDrive Workshop this spring in San Antonio, Texas. This will be held in conjunction with the Commercial Vehicle Safety Alliance Spring Workshop. It's going to be a one day workshop on April 21, and attendance is open to everyone. More details will be available on the CVSA Web site, and their Web site is listed right there, [www.cvsa.org](http://www.cvsa.org).

We are now putting together the agenda. It will include presentations on current IntelliDrive research activities, and it will serve as the first working group meeting for those who are interested in working with DOT on commercial vehicle and IntelliDrive issues.

#### SLIDE 45: CV INTELLIDRIVE WORKSHOP INFORMATION

If you would like more information on the Commercial Vehicle Working Group for the April workshop, you can contact me or Jon Mueller at FMCSA, or you can simply register for and attend April 21 workshop, and you will have the opportunity to join the working group there as well.

That concludes the presentations. I will turn it back over to Jon, who will introduce the last segment, which is questions and answers.

#### SLIDE 46: AGENDA

**Jon Mueller (General Engineer, FMCSA ART):**

Thanks, Alrik. I appreciate everyone's information today.

Like Kirse said, the presentation is going to be available for download and if there are any questions, we would be happy to take those now.

SLIDE 47: CONTACT INFORMATION

[40:55]

## QUESTIONS AND ANSWERS

Kirse Kelly: Yes. This is Kirse Kelly and, like Jon said, we are now open for questions. If you would like to ask a question, you can submit questions by typing them in the space at the bottom of that **Q&A Box** on the lower-left side of your screen. Now, if you want to ask questions over the phone, you just simply hit \*1 on your phone and when your line is open, Jackie our phone operator, will announce you by name—so please state your name clearly for proper pronunciation. The questions will be answered in the order that they are received. As mentioned at the beginning of the call and as Jon just mentioned, you will be given an opportunity to download the presentation at the end of the webinar.

Jackie, are there any questions on the phone?

Jackie (Operator): We do have one question of the phone.

**Question:** *The question I have is for Richard, the New York State ITS. You indicated the commercial vehicles—it sounds like the onboard diagnostic codes are more standardized between the vehicles than a passenger car fleet. I was wondering if you could comment on that. On a passenger car fleet there are only about 20–40 codes that are standardized related to the engine. The rest of the diagnostic codes, like seat belts, that you reference—they are proprietary. Is it similar in the commercial vehicle field, or is it more standardized?*

Richard

McDonough: Let me preface this by saying I am not a technical expert in any aspect of this, but my understanding is they are more standardized and there are many more of them. I certainly can give you contacts of people who know this inside and out within the Volvo team, but my understanding is in a modern truck there are somewhere around 500–600 different data information you can pull—messages that you can pull—from the databus.

**Question:** *For V2V, have you thought about train and vehicle collision avoidance?*

Brian Cronin: Yes, we have a component of the research program looking at train, both light rail and heavy commuter rail, and how that fits in. We do have one issue of—

at least when you are talking about freight and heavy rail—about sort of the communication needs and time for stopping, and so forth. We have an element of the program in our strategic plan targeted at that area.

Rich

McDonough: We have kicked that around for quite awhile, actually. My personal belief is that there is actually untapped potential here for this technology with train control issues. Certainly, from a highway grade crossing perspective, this is certainly a pretty easy lift. It is not all that dissimilar than some traffic signal interfaces and work that we are pursuing. It clearly holds a vast potential and particularly in terms of connecting grade crossings with traffic signals in kind of a local area network perspective. We have some considerable problems in this area down in Long Island where we have essentially a huge east-to-west railroad—the Long Island Commuter Railroad—and our highways go north and south, and there are over 300 at-grade crossings along the system. Of course, the traffic volumes on the highway side are huge, and the train volumes are huge as well. You run into a lot of problems using modern technology sometimes when you are dealing with electrified railroad operations. Our belief is that this is a pretty good fit for SMART grade crossings talking to the vehicle, warning them when a train is approaching, etc. We may actually pursue that in future phases of CVII.

***Question:*** ***Will this be just for New York State?***

Jon Mueller: I think the easy answer there is, obviously the information that Rick presented is specific to activities within New York State, but IntelliDrive, in general, is not intended to be isolated to any one region of the Country.

Richard

McDonough: Jon, I think that is a real important issue. For instance, most of the work that we are doing with the Volvo team is actually happening in Greensboro, North Carolina. That roadside device is going to be connected to our Long Island System. When we complete everything down in Greensboro, we are bringing that truck up—what is that?—1000 miles, or whatever distance, to the Long Island Expressway, and it will work. At least, if we do our job properly, it will work exactly the same, whether it is in Long Island or Greensboro. That is really one of the tremendous benefits of this program—this technology—is that it requires it to be interoperable. If you have a compliant vehicle or compliant infrastructure, it should work no matter what the combination.

***Question:*** ***Will this program replace the two existing transponder systems?***

Jon Mueller: Does anyone want to take that? Jeff Loftus is here, the Chief of our Technology Division.

Jeff Loftus: I don't believe the technology will replace the programs. I believe that it is an opportunity, as Rick alluded to, to look to streamline and consolidate the

technology piece, and it is an opportunity for an upgrade if we are successful, collectively, in our efforts.

Rick, what is your view on that point?

Richard

McDonough:

I agree, Jeff. I think we are giving drivers, carriers, and vehicle owners a choice. Personally, I think it is somewhat similar to what we are seeing with navigational information in the cockpit of vehicles. A lot of the standalone nav devices—the sales are really dropping. People are going to smart phones or smart PDAs, where you can get the nav application, but you can also get 100,000 other applications. I think that is a good example, and I would say that this is very similar to that. All of the 915 RFID tags will still work, which is why we want to pursue the 5.9 interoperability with the screening systems—we don't want to preclude any of the existing systems from not working. But if you have 5.9 you can do that and a number of other things.

**Question:** *I would think that the privacy concerns would be a key obstacle. How would this system be delivered to vehicles and what incentives would need to be provided to owners of commercial vehicles and private automobiles?*

Jon Mueller:

If I understand the question correctly—the technology is intended to be installed at factory levels, primarily, with some thought down the road, in terms of IntelliDrive, for aftermarket approach. I'm not sure if anyone else on the line wants to address the privacy issues—?

Alrik Svenson:

As far as privacy of data and security, this is one of the issues that we are looking at in the V2V plan under interoperability, and work has commenced on that right now.

Richard

McDonough:

Jon, I think you really have to be careful in how you are describing privacy in what you are talking about, and certainly the situation of the application. Clearly, there are privacy issues. Financial transactions for instance—tolling transactions, or any other kind of financial transaction—you would want that to be highly secure. Probe information—in general, we would want it secure and we don't particularly care about any kind of—what we would call “personal identifiers.” When you get to the commercial vehicle world, it is a little bit different. The roadside inspection operation makes it different. Kind of the nature of the operations—the Federal and State regulations—make it different. I am not sure, in terms of driver identification, we have a privacy issue, but we will always have an issue of making sure that information that needs to be secure is secure. Whether it is private information from a truck for a carrier to a fleet manager or it's a financial transaction, we are always going to have to deal with that security issue. From an IT network point of view, which this technology requires—a large network—that is an ongoing issue that we always constantly need to stay on top of.

Jeff Loftus: There are Federal laws—the Privacy Act, there are requirements from the White House Office of Management and Budget, regarding the secure transfer and storage of information that is necessary to carry out various activities. There is also a transparency that is built into the system. A key element to the regulatory decisions that Alrik spoke to will be proving in the field and in the test program that the systems are secure and privacy is protected, or they will not be viable and it will not proceed. That is a key element in the test program. But as Alrik also suggested, we want to hear in more detail from the end users who really know these issues very well, in these upcoming discussion events that we are going to be having—some of the mechanics and operational concerns, as well, regarding that.

Jon Mueller: I just want to check, Jackie, if there are any questions on the phone.

Jackie (Operator): You do have a few questions on the phone. Your first question is from Jonathan Coleman. Your line is open.

**Question:** *My question was already answered when I typed it in. Thank you.*

Jackie (Operator): You do have one additional question. I did not catch the name of the person, but he is from the Nevada DOT. Your line is open.

**Question:** *In this presentation—it is mostly focused on the safety issues. I am wondering whether you are focusing on using the ITS technologies to increase the road capacity—basically, automating the trucks, something like that? Because we are doing a study to explore that option on the I-80 corridor east of Reno's Park—that is a roadway in Nevada—and Caltrans and Berkley are doing the same study. I think they are about to test their first truck platoon or enhanced—technologically-enhanced trucks. I am wondering whether you are focusing on that issue. My question is—are you focusing using the technology on increasing the trucking capacity in addition to safety?*

Tom Kearney: There is a separate aspect to the V2I which is the mobility which opens up the trucking industry partnership quite broadly. It has a lot to do with facilitating coordination and interface with the trucking industry telematics, along with the infrastructure protection and the enforcement component. Moving—basically, Smart Roadside rings that whole service-based and enforcement-based approach to information sharing at the roadside. Indeed—now, if you are talking about onboard truck information systems and technologies, I will switch that back over to Motor Carrier. If you are talking about the productivity—the mobility of freight out on the highway system—that is exactly what we are trying to address within our CVO Freight IntelliDrive road mapping exercises.

Jeff Loftus: Just to add—we will have some subgroups set up at the San Antonio meeting to speak to not only to the safety elements of IntelliDrive for commercial

vehicles, but also the mobility element and also the environmental. So, granted, this presentation is focused on the safety applications, but the mobility and environmental applications are also key elements to the overall commercial vehicle IntelliDrive program, for both trucks as well as motor coaches.

Richard

McDonough:

I probably did not say this when I was describing our CVII project, but under the second test, Test 2—that was to send both probe information from the vehicle to the roadside and then signage, and TMC ITS information from the roadside to the truck. We did that successfully and demonstrated it. I would certainly agree that mobility is important, and sometimes mobility and safety are the same end—or different sides of the same coin. Obviously, the better information we give to drivers, the lower the potential for some kind of safety problem through rear-end collisions or whatever. So, yes, mobility is a big part of that and certainly, from a transportation agency that maintains and operates thousands of miles of highways, we are focused on that, as well as the safety benefit.

Tom Kearney:

You can go back up to IntelliDrive at the most broad level—and Brian Cronin kind of opened with this—to really answer the question. The trucking, the mobility on the roadway, facilitation of more efficient and higher capacity intermodal interfacing when that container is coming off the train and coming to the truck, and probe information is being generated—geospatial information is being used to be able to time those kinds of transfers. It speaks back to the question also on safety that was raised earlier: “Does the truck know when the train is coming?” Yes, there is also a very important safety-based aspect to that same kind of intermodal intelligence that our Joint Program Office envisions as positioning itself with the cross-modal and the very comprehensive approach which they are embarking in the ITS Strategic Plan and specifically within IntelliDrive. I hope that answers your questions nine times over.

**Question:**

***When you speak about the Smart Park Program, we are about to build a new Welcome Center in Bennington, Vermont, and we would like to know if there is anything we can do to facilitate Smart CVO Parking?***

Jeff Loftus:

I will start, but then defer to Tom and to Rick. FMCSA is doing some experiments of evaluating sensor data, or sensor technology to come up with an accurate count of trucks leaving and entering a facility which, on the surface, sounds like a pretty straightforward endeavor, but when you look into the details, with drop and hook and other unique operations to trucking operations, and mixed use of these facilities and facilities that are not marked with open access, it gets very complicated as opposed to a defined parking garage, if you will. So, we are doing some of the initial research work, but as Tom Kearney referenced from FHWA, the Federal Highway Administration is

overseeing a grant program under SAFETEA-LU, Section 1305, to actually deploy some of these applications. I will turn it over to you, Tom.

Tom Kearney: Thanks, Jeff. I feel like I should say, “The following is an announcement brought to you with the Federal Highway Administration,” but the truck parking program has seven different eligibility criteria tied to it. The first two projects we advanced are both ITS or telecommunication-based approaches. Very similar, tracked very closely with the Smart Park research that Motor Carrier has underway. There are other aspects to truck parking programs regarding building capacity, new capacity at locations, building new locations, improving geometry at current locations, and making seasonal, year-round facilities. There is other eligibility that Congress wrote into that program beyond the technology. The purpose of today’s call is basically the safety and the technology-based discussion, but please get my contact information off the last slide and get in contact with me if you have questions. There should be, I would expect, future solicitations under the program depending upon Highway Acts and resources—future resources becoming available. Please be in touch.

**Question:** *What is your plan to broaden the 5.9 GHz chip providers? We have been depending on one source, Atheros, for the last 10 years.*

Jon Mueller: I am not prepared to talk about the providers. Maybe Rick, if you had some experience with your involvement with Kapsch?

Richard McDonough: I don’t know enough about that, Jon. Ironically, we have actually got a chip manufacturer moving into my community, but I have no idea about that. I am going to presume that part of it is market demand, but I would defer to the hardware providers and people like Kapsch to answer that.

Jon Mueller: I think that is probably the best answer—outside some of the scope of what we are looking to do.

Brian Cronin: Jon, what I could add to that is part of the V2V work plan and the light vehicle side. In the work we did previously, we had one product used for the onboard equipment. Now, in this next phase of research, the intent is to get four different product suppliers providing onboard units that provide 5.9. My understanding is there is a different array of vendors and suppliers out there that might be able to provide products that meet the overall requirements. Hopefully, through that effort we will start to see a wide array of approaches and technologies, and chips and things that can do this.

**Question:** *How will you manage driver distraction?*

Brian Cronin: Isn’t that a NHTSA issue?

That is a critically important issue that we are dealing with. What I think we would say is that the opportunity in terms of safety and mobility benefits that this technology provides is so vast that we are committed to trying to figure out how to do it effectively, considering the driver distraction. So we have a significant portion of the research program aimed at human factors—driver distraction issues—so that we can get to a point when we are ready to make decisions related to implementation, that this could be feasible and done in a way that doesn't make driving unsafe.

Richard

McDonough:

I would like to add to that—we have a driver distraction issue with or without 5.9 technology. We always need to be aware of that—that with any kind of wireless communication, whether it is a nav device, or cell phone, or texting or whatever, we have got to prevent people from being distracted. That is one of the beauties of this technology. It really—at least, kind of—at its fullest potential, gives us the ability to deal with those safety critical situations where you need to have a driver respond appropriately, and if they do not, you can deal with that. I don't know of another way that we will ever get past that kind of human behavior issue, or human decision factor, in terms of reducing accidents and improving safety.

**Question:** *Isn't there an implication of liability when one driver advises another driver if it is safe to pass?*

Alrik Svenson: Well, it seems like these kinds of issues really need to be looked at carefully. I think with any new technology, these kinds of things can arise, and we really have to, at the beginning, really take consideration of these kinds of issues and look at what can be done to make a system that is safe and reliable, and will work consistently in all situations.

**Question:** *How can we participate in New York's Phase 2?*

Richard

McDonough:

It depends on who is asking the question, I suppose. If it is somebody looking to be part of the team, that is all ready established. We went through a competitive process. If it is an entity that just wants to be informed or kept abreast on what we are doing, anybody can be part of our mailing list. They can contact me, I think my e-mail is on the presentation, and they certainly need to be added. If there is another angle of this or aspect, they can certainly send me an e-mail privately, and state their case or what their perspective is, and we can deal with that.

**Question:** *It looks like that the system requires that every vehicle should be equipped with the communication device. How realistic is that?*

Alrik Svenson: I think for some applications, it will not be necessary for every vehicle to be equipped to get some safety benefits out of it. However, for other things, it

will require that all vehicles have this technology. So, we are now actively looking at retrofits and aftermarket solutions which will accelerate having wireless communications in all vehicles. That is a key component of the IntelliDrive program as it is right now.

**Question:** *Many OEMs are already far into development of similar systems. How will you, assuming you will, consider or merge their efforts with yours?*

Jon Mueller: Just from my knowledge of what is happening, we have within DOT a project called CAMP (Collision Avoidance Metrics Partnership) that is involving several of the passenger car companies involved in V2V and V2I. We obviously have involvement now in the commercial vehicle side. The effort is there to make sure we are taking into account work that has been done or is planned with those.

Jeff Loftus: In Asia, as well as Europe, and other parts of the world, the international manufacturers—a lot of these systems are even more on their way in terms of deployment. The other element is the fact that this technology is also an opportunity as an enhancement to the autonomous-based systems, because we are really talking about cooperative systems that will help identify and help mitigate some of the false alarms and false-positive issues that some of the current autonomous-based systems have.

Richard McDonough: I think the numbers—I am sure there are people on the phone that know the numbers better than I do—but I remember seeing, two out of every three commercial vehicles has some kind of wireless communication device that has to do with their fleet operations or driver management or whatever. So for the commercial vehicle industry, having these devices in a cab and using them on a daily basis is a very normal familiar thing for them.

If we look at a lot of the devices to do navigation; to do tolling; to do electronic screening; to do border crossings—I would suggest that by the time they get into all of those different pieces of that equipment, none of which are interoperable, if we could replace it with one piece of equipment that could do all of those things and then some—at least from a financial point of view, it is a little bit easier for the carriers or vehicle owners to get a return on their investment.

**Question:** *Can you please expand on the V2V data. What is transferred and what is it used for?*

Alrik Svenson: The extent of this is still being determined by what we need as far as the safety system. There is a great potential for all kinds of available data. We would like to maximize the potential for safety applications to take advantage of this transfer, so that they can work more effectively and thereby obtaining greater safety benefits than being an autonomous system on its own. There is a

lot that can go along with this. Right now, it is still in the research phase. We are still determining what would be the most effective. As far as the commercial vehicle side on safety, we still have to pick the most critical safety applications that we want to go and attack first. This is still really under development. Rick, if you would like to comment on some of the data that you are doing in your project—what data is being transferred between vehicles right now?

Richard

McDonough: We have not gotten into that fully, but when we do, it is just going to be those kinds of basic locational information—beacon probe information, with the vehicle basically saying, “Here I am. Here is my position. Here is my speed,” etc. And then those vehicles communicate, and they do the calculations and they figure out where they are, and what the braking distances are, or positionally where they are among each other. It is pretty basic information. Although I have to preface this by saying we are not there yet.

**Question:** *Along the lines of the rail-warning interface, will emergency vehicles be able to emit approach warnings via V2V within a limited range? Can you briefly discuss the role of CVO V2V toward improving travel-time reliability, (i.e., disseminating travel-time info for the variability of travel times can be reduced)?*

Jon Mueller: I will take a stab and open it up. I think there is so much to IntelliDrive that can benefit several scenarios that can be imagined. These are just two. I believe things like this, is the overall goal of what we are trying to do with IntelliDrive.

Richard

McDonough: Essentially, what we are talking about is making traffic signal controllers smart enough to deal with the information that will be available to us through 5.9 technology. So, there are a couple of activities that are underway now through ASHTO in a pool-fund study. That is to look at signal phasing and timing issues, and to look at algorithms so that we can mesh 5.9 technology with the existing traffic signal control technology.

The implications of that is that we are looking at the traffic signal—the traffic signal intersection—scenario, and once we can communicate with that controller, then it is simply a matter of working out the operational procedures to give, for instance, an ambulance priority. Again, that goes back to the basic operations, and phasing and timing of the signal operation, and the ability of that signal to communicate with the 5.9 network. Essentially, it is a pretty easy thing to do.

**Question:** *Are all of the SAE message sets that you have used for your project fully adopted by SAE?*

Rick

McDonough: I think the simple answer is yes. My understanding—and again, I am not an expert here—is that there are standards for certain message sets. Some of those standards or scenarios could certainly use a modification or expansion in my understanding. Beyond that, I will probably get myself into trouble. I would say, the core foundation is there, but as we expand applications and potentials of this technology, there is probably additional work that needs to be done.

**Question:** *What is the Web site for ITS?*

Brian Cronin: It is [www.its.dot.gov](http://www.its.dot.gov).

Kirse Kelly: Once again, [www.its.dot.gov](http://www.its.dot.gov).

Jon Mueller: Are there any more questions, Jackie, on the phone?

**Question:** *Do you see V2I being implemented or online before V2V?*

Jon Mueller: Anyone can answer that I think, but the progress so far is that V2V is ahead of V2I, but I do not think that there would be any intention to do one before the other.

Rick

McDonough: I think it depends on what you are exactly talking about, such as intersection-crash avoidance which is really V2V and V2I. We are not there yet. If you are talking about just basic—what I will call passive information, probe information from the vehicle to the roadside to help with congestion mobility, traffic management, whatever, and then signage and incident information—essentially taking a variable message sign and sticking it inside the cockpit of the vehicle—we are there. There is no doubt about it. We have shown it in Long Island. We have done it down in Greensboro. That is pretty simple pickings. The rest of it, the non-technical issues, there are some things that need to be addressed, and as we get into more sophisticated dynamic information, safety-critical information—scenarios such as crash avoidance between two vehicles—that is a longer way away and requires a lot more work on standards and policies, etc.

**Question:** *A few data link protocols were mentioned in the presentation—J1939, J1708. Will DOT decide which one will be used for this purpose?*

Jon Mueller: I don't think the DOT is in a position to make a ruling on that. I think that is maybe an industry question. Technologies that exist, that provide benefit to this overall effort, I think, are the ones that will be involved. Again, I think it is primarily a vehicle OEM question. Anyone else care to comment?

Alrik Svenson: That is the reason DOT cannot go at this alone. We have to be involved with the industry to determine the best solutions to all of these issues.

**Question:** *What version of IEEE 802.11p is being used for developmental demonstrations and what version will be used for implementation?*

Richard

McDonough: That is way over my head. It took me years to learn 802.11p. If the person could send me an e-mail with the specifics, I will get them an answer.

**Question:** *How will retrofit products be installed? Who will do the work?*

Jon Mueller: I think that is a tough question to answer. It probably has several answers, so it remains to be seen how the best way that will be implemented. Again, I think that is market driven.

Richard

McDonough: Jon, there is an issue on definitions too. I think retrofit in some circles means a certain thing versus aftermarket. I consider what we are doing with our vehicles—both our maintenance vehicles, our plow trucks, and the tractor trailers—there is a retrofit. We are trying to incorporate it seamlessly—embed it in the dashboard, built-in screens, that type of thing. If you're talking aftermarket, it could be like a transponder that you might hang in your window. If it is a retrofit, clearly, the vehicle owner would certainly need to be a key player. That is one of the advantages or benefits in our program, is that we are dealing with trucks that we own as a fleet operator, so we can handle those issues a little easier than if we were to go to a common carrier, for instance. To some degree, it is similar with transit vehicles—we also have plans to do some work on bus fleets. Because we, as a Government agency, provide a lot of transit subsidies, we have a little more position or leverage to deal with those issues than if we were just working with a private operator.

Jon Mueller: I want to just make a mention, here—if we do not get to your question, we will try to correlate it to the registrants on the call—but if your question does not get answered, feel free to e-mail it to any one of us. We will be able to reply and get an answer for you.

Jackie (Operator): We do have a few questions on the phone now. Your line is open.

**Scott**

**McCormick:** *I just wanted to mention, on the question of the ASTM and SAE [Editor's note: Correction–SAE] standards on the commercial vehicles, 1587—ASTM J1587 [Editor's note: Correction–SAE J1587]—defines the communication protocols that are required to be used, and there is a whole subset of elements in terms of the physical connectivity, but that is the primary one. The diagnostic trouble codes fall under J2012. What you should not confuse those with is SAE J2735, which is the message set that was developed for passenger vehicles and light trucks.*

*I also want to say, gentlemen, that I thought you did a commendable job of putting together a well-thought out and well-coordinated work program with the other aspects of this environment.*

**Joe Peters:** *I also would like to congratulate you on a very informative presentation.*

*I am out here at Federal Highway R&D. Just a couple of comments on things that have been mentioned in the past. Going back to the conversation from Nevada DOT regarding work that is being done at PATH (Partners for Advanced Transit and Highways) out in Berkeley, there is an exploratory advanced research program that Federal Highway funds. One of those efforts is indeed the work that we are doing in Cooperative Vehicle Highway Research. Indeed, the folks at PATH are looking at 5.9 as a method of vehicle-to-vehicle communication for the purposes of platooning. And indeed, there are some efforts going on there where they are looking at the platooning of trucks, and they are expanding the scope of that from, instead of one truck platooning with another, but to add a third truck in that platooning scenario, which then creates a complex environment to see how that technology will work. The bottom line of that is that I am interested and have not heard about what is going on in Nevada and would very much like to get in touch with the gentleman from Nevada DOT to learn more about what they are doing on I-80. I am interested in that.*

*My second point is that many of the technologies that have been discussed in today's presentation are crosscutting. For example, the issues of communications, and the questions of signal phase and timing pertaining to signal control and communications of signal information to vehicles, and vice versa, with regard to vehicles' intentions—this is very much interesting to us Turner-Fairbank and indeed, is a part of the vehicle-to-infrastructure communications roadmap. Signal phase and timing are a big piece of that and there are intentions to pull together stakeholders to actually review how that might be implemented.*

*The hard part of the challenge is that by creating certain "bins," in which we are looking at the research, there are crosscutting issues that need to be coordinated. I would hope that whoever is looking at signal phase and timing from a freight perspective would also include signal phase and timing in other scenarios. So, we do have expertise out here in that and would certainly like to participate in that conversation.*

*Third point is that Jeff Loftus mentioned the meeting in San Antonio. It kind of reinforces this theme of—it is not just freight for safety, but there is going to be a discussion on mobility. That is news to me, and I'm glad that Jeff made that comment. I know it might be mobility that is limited to commercial vehicles, but nevertheless it broadens our interest. So, I remain intrigued to learn more about that and possibly have someone here participate in that.*

Jon Mueller: Is there another question on the phone?

Jackie (Operator): We have one more question on the phone. Your line is open.

Ray Resendes: I just wanted to clarify a couple of comments from earlier on. There was a concern about liability from if you give someone—told them it was okay to pass. We are basing most of our work on the J2735 message set, which basically just pumps out information, so the warnings are developed onboard your vehicle based on the information around you. Then there was a follow-on question about competing standards. Unlike in Europe, most of the standards that have been mentioned on this phone call today are complementary and compatible, so we are not really in an issue of competing standards. And that is it.

**Question:** *Is this solution intended to integrate into existing vehicle monitoring existing telematics systems or is it meant to be a new standalone application?*

Jon Mueller: I do not think the intention of IntelliDrive is to replace anything. It is meant as an enhancement of systems that perhaps are out there. Brian, from the JPO perspective?

Brian Cronin: My perspective is that it supplements and—it depends. I think that DSRC (Dedicated Short-Range Communication) Active Safety Applications is new, but IntelliDrive encompasses other wireless communications that are being used and available today or will migrate to more effective communications means. It is somewhat both.

**Question:** *Will the data sets from the pilot IntelliDrive tests be available online for research and if yes, where do we get those?*

Jon Mueller: I do not know the answer to that. Rick?

Richard McDonough: I would be surprised if we offer them in the near future online. If somebody wants to do some research and stuff, by all means, they can contact me and we'll work with them. We have no problem sharing the information from our tests or demonstrations.

**Question:** *You mentioned functionality to include a sharing plow-up and plow-down information. Can you share more on how this data will be shared and presented to other vehicles?*

Richard McDonough: Obviously, it will work itself out in terms of details when we finalize the concept of operations. Certainly, it would depend on who the recipient of the information is. If it is a vehicle behind the plow truck and it is approaching the plow truck on an interstate in the same direction, we would say something

like, “Snow Plow Ahead – Warning: 30 mph,” whatever it may be. If it was off to the side of a construction site, a similar type of message. If it is for a fleet management or operational purposes, for instance, my colleagues, the information, I am guessing, would be richer, and it would be more detailed and more specific for their program responsibilities and needs—salting information, or we might monitor our weather conditions. That is one of the great things about this—once you start receiving this rich data set, almost the sky is the limit. You can integrate it with other information. I think the potential is overwhelming, quite frankly. But I think it would depend on the recipient of the information, the user.

Jon Mueller: Excellent. Well, I really appreciate everyone’s time, being involved in the call today. We are out of time for questions.

**[1:27:55] (End Time for Q&A Period)**

Kirse Kelly: So, this will conclude the presentation part of our webinar, but before you sign off, if you could just complete this evaluation you see on the screen. Also, if you would like to become a member of the IntelliDrive working group, please either contact Alrik or Jon, or you can write your e-mail address here and we will contact you with further information. Please note your comments can be viewed by everyone in the meeting room. So, if you’d like to remain anonymous, click on **Everyone** and choose **FMCSA Host**. We will be the only ones that see it.

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On February 10, we are going to host a webinar about the National Truck and Bus Crash Picture, where Dr. Ralph Craft of the ART, Analysis Division will present the 2008 Motor Vehicle Crash Data. Registration for that webinar is already open, so you can just go to our Web site at [www.fmcsa.dot.gov/art](http://www.fmcsa.dot.gov/art) to register today. We will be sending out announcements of this and other webinars. If you are not on our e-mail list, you can contact the web conference coordinator. That is me, [kirse.kelly@dot.gov](mailto:kirse.kelly@dot.gov) to request your name be added to that list or you can just let us know in this little Chat Pod today.

This concludes this webinar. Once again, thank you all very much for participating and thanks to Jackie, our phone operator.

**[1:30:16]**