UNITED STATES PATENT AND TRADEMARK OFFICE

SIEMENS MOBILITY, INC., GROUND TRANSPORTATION SYSTEMS USA, INC., HUMATICS CORP., and PIPER NETWORKS, INC.,	IPR2023-00468 Patent 9,043,131
Petitioners,	
v.	
METROM RAIL, LLC.	
Defendant/ Patent Owner.	

DEPOSITION OF

SCOTT ANDREWS

August 28, 2023

Reported by:
Darla Kmety
CSR No. 12956, RPR

Job No. 10125462

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Deposition of Scott Andrews, a witness held at 401 W. A Street, Suite 1680 San Diego, California at 9:17 a.m. taken on behalf of the defendant before Darla Kmety, CSR 12956.

A P P E A R A N C E S

For Plaintiff:

Wisnia PC
12636 High Bluff Drive, Suite 400
San Diego, California 92130
Howard Wisnia, Esq.
(858) 461-0989

For Defendants:

McAndrews, Held & Malloy
500 West Madison Street, 34th Floor
Chicago, Illinois 60661
Gregory Schodde, Esq.
Rajendra Chiplunkar, Esq.
(312) 775-8203

Faegre Drinker Biddle & Reath LLP
222 Delaware Avenue, Suite 1410
Wilmington, Delaware 19801
Tatcher Rahmeier, Esq.
(302) 467-4200

Present on Zoom:

Vincent Galuzzo, Esq.

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SAN DIEGO, CALIFORNIA at 9:17 a.m.

August 28, 2023

SCOTT ANDREWS,

having been duly sworn, testifies as follows:

EXAMINATION

BY MR. CHIPLUNKAR:

Q Good morning.

A Good morning.

Q Please state your name.

A Scott Andrews.

Q What is your formal mailing address?

A 704 Paula Lane, Petaluma, California 94952.

Q Have you had your deposition taken before?

A Yes, I have.

Q I'll go over some guidelines that you may be already familiar with. Please let me complete my question before you start your answer. Please provide all answers verbally. If you do not understand my question, please ask for clarification. I plan to take a break every hour or so. If you need a break sooner, let me know and we can break after I've completed my line of question on a particular topic. Is that okay with you? Can you comply with these guidelines?

A Yes.

Q From time to time, your counsel may object to my question or unless he instructs you not to answer, you are required to answer my question. Do you understand this, sir?

A Yes.

Q Now, you are here to be deposed on your opinions set forth in two declarations that you submitted in connection with inter partes review IPR 2023-00470 and IPR 2023-00468, correct?

A I'd have to look at the numbers, but I'll take your word for that.

Q I will refer to these IPRs as the 468 and the 470 IPRs for ease. Is that okay with you?

A Is that the numbers on the -- the IPR numbers?

MR. CHIPLUNKAR: Yes, the IPR numbers.

MR. WISNIA: Mr. Chiplunkar, I mean, do it as you prefer, but I think it would probably be easier for all of us if you refer to it by the patent number, the 131 and the 227, but you do it as you prefer.

MR. CHIPLUNKAR: Yeah, I will as I prefer. Thank you.

BY MR. CHIPLUNKAR:

Q Let me mark these two declarations. So this will be marked -- so the declaration I just handed you was

previously marked Siemens Exhibit 1003. Do you see that at the bottom?

A Yes, I do.

Q And it was submitted in connection with the 468 IPR, correct?

A Yes.

Q So I'm going to mark this 1003 Exhibit as 1003-468.

(Exhibit Number 1003-468 was marked for identification.)

MR. SCHODDE: Could we go off the record for a minute?

(Off the record.)

MR. CHIPLUNKAR: Back on the record.

BY MR. CHIPLUNKAR:

Q Sir, I just handed you another declaration. And this was also marked Exhibit 1003 and this was submitted in the IPR 470. Do you agree with that?

A Yes.

Q Okay. And we're going to mark this as Exhibit 1003-470.

(Exhibit Number 1003-470 was marked for identification.)

BY MR. CHIPLUNKAR:

Q Now, in Exhibit 1003-468 you set forth your

opinions regarding the validity of U.S. Patent 9,043,131, correct?

A Yes.

Q And in Exhibit 1003-470 you set forth your opinions regarding the validity of U.S. Patent 8,812,227, correct?

A That's correct.

Q Let me go ahead and hand you those two patents. So I just handed you U.S. Patent Number 9,043,131; is that correct?

A That's correct.

Q And this was previously marked Exhibit 1001 in the 468 IPR, correct?

A Yes. That's right.

Q So for the record, we're just going to mark this as Exhibit 1001-468.

(Exhibit Number 1001-468 was marked for identification.)

BY MR. CHIPLUNKAR:

Q Sir, I just handed you U.S. Patent 8,812,227; is that correct?

A Yes.

Q And this was previously marked Exhibit 1001 in IPR 470, correct?

A Yes. That's right.

Q Okay. So for the record, I'm going to mark this as Exhibit 1001-470.

(Exhibit Number 1001-470 was marked for identification.)

BY MR. CHIPLUNKAR:

Q I will refer to these patents by their last three numbers. Is that okay with you?

A Yes, that's how I refer to them as well.

Q Okay. And now, both of these patents share the same specifications, correct?

A That's my understanding, yes.

Q Did you prepare for today's deposition?

A I did.

Q How long?

A Over the last few days.

Q And did you prepare by yourself or did somebody else prepare with you?

A I prepared a little of both. So I did a lot of reading. I read my declarations, read through the patents, read through the R and then had a telephone Zoom meeting with -- or some kind of an online meeting with the attorneys.

Q And approximately how many hours did you spend preparing for the deposition?

A Probably about 20.

Q Did you review the prior R as part of your preparation?

A Yes, I did.

Q Do you review the patents themselves?

A Yes.

Q And do you review any other materials?

A I read the institution decisions and my declarations.

Q Okay. How many hours did you spend preparing those declarations?

A Oh, gosh, it's been eight or nine months, so I'd have to go back and look. But I don't know. 40, 50 hours.

Q Each?

A No, probably total.

Q Total. And now, the prior R that was cited there, did you look for those prior R references?

A I don't recall. Probably not.

Q So where did you get the prior R references from?

A They would have been provided to me by counsel.

Q Okay. And what is your billing rate?

A $500 per hour.

Q Okay. I'm going to ask you questions regarding your background and experience. Do you maintain a

LinkedIn profile, sir?

A I don't recall. Probably. If there is one, it's pretty old.

Q Okay.

A I don't use LinkedIn very much.

Q Okay. So I'm going to hand you a document that I printed from LinkedIn. This is going to be marked Exhibit 2003. We had previously marked 2001 and 2002.

(Exhibit Number 2003 was marked for identification.)

MR. WISNIA: Counsel, are you going to mark it the same number in both cases?

MR. CHIPLUNKAR: Yes.

BY MR. CHIPLUNKAR:

Q So is this -- do you recognize this printout?

A It's been years since I looked at this, but it appears to be something that I think was probably put together by my staff at the time or LinkedIn, and it's got excerpts of my resumé and excerpts of a summary of my expert testimony.

Q When was the last time this was updated?

A I have no idea. Probably 2014. 2015.

Q Who created this LinkedIn profile?

A Well, I probably created the LinkedIn profile. I don't recall whether I put this content into it or

whether one of my employees did.

Q And you currently are a managing partner of Cogenia Partners, correct?

A That's correct.

Q And how many employees does Cogenia Partners have?

A Two now.

Q Who is the second person?

A The other one is the managing partner. It's Susan Takami.

Q Okay. And what percentage of Cogenia Partners' revenue is generated from patent litigation?

A Well, depends on what time you ask. Over the years I've been -- I've had Cogenia Partners now for 22 years. And at times it's been a hundred percent research for either carmakers or the USDOT, and at times it's been, you know, nearly a hundred percent work in testimony. Depends on when -- government contracts kind of come and go. So...

Q How about last year? How much -- what percentage of your --

A Last year would have been a hundred percent expert work.

Q How about the year before that?

A Probably 90 percent.

Q And this year?

A So far, a hundred percent.

Q Now, Cogenia has a web page, correct?

A Yes.

Q And is that web page kept up-to-date?

A Reasonably. I mean, I have it as -- in order to have a web presence. Most of my work is done either through existing relationships or through word of mouth. Every now and then some people will find me through my website, but not -- not my primary means of communication with the outside world.

Q Who maintains the website?

A It used to be the same people that did this LinkedIn profile, I believe. But recently, the company that was hosting it changed, and so I basically redid it myself.

Q You mentioned Cogenia today has two employees, correct?

A That's right.

Q Were there at any point in time more than two employees?

A There were -- at one time there were three actual W-2 employees: Myself, Susan Takami, and a guy named Jason Redd -- excuse me -- Jordan Redd. And at other times I've had what I call associates which are

basically contract employees who come onboard and work on a contract basis for particular projects.

Q And these contract employees, when was the last time you had these contract employees?

A Probably 2018. It was a USDOT project.

Q And these contract employees, did they help you with your expert work or did they help you with your projects?

A Actually, that's a good point. So the last contract employee would have been probably 2019. Maybe even 2020. And that would have been someone that was helping me with some expert work. But most of the time and by far the predominance of the hours that have been billed are for government contract work.

Q And when was the last time Cogenia received a government contract?

A Probably 2018. I'd have to go back and check but...

Q And what was that contract?

A That was a contract with the -- it was a subcontract through Booz Allen Hamilton. The prime contract was part of what's known as an IDIQ. It's an indefinite duration, indefinite quantity contract. Funded by the U.S. Department of Transportation. We were doing work on Connected Vehicles for the National Highway

Traffic Safety Administration.

Q And these were automobiles?

A It was a system that's called Connected Vehicles, but it really is dealing with radio communication between all sorts of surface transportation vehicles.

Q And what was -- is that contract complete?

A Yes.

Q And what portion did you do? What was your job in that contract?

A My job -- I guess the official title was the subject matter expert, technical subject matter expert. I basically designed the entire study strategy or research strategy for the project. It was an idea that the contract employee of mine and I came up with. We then took it to NHTSA and explained to them why we thought it would be valuable. And then they contracted through Booz Allen which is -- I've done a lot of work through Booz Allen, and we're not big enough to be a prime contractor with the government. So they then contracted through Booz Allen and we were hired as a subcontractor through Booz Allen.

Q And what is that project called by the DOT?

A I'd have to go back to get the exact name, but it was basically -- it was a -- what we call misbehavior

detection and mitigation. And the issue we were dealing with is that when you have vehicles communicating with other vehicles, or with the roadside, and sending messages about their current status, there's always a risk and I've spent a great deal of my time with NHTSA over this in the last 10 years.

There's always a risk that they're not telling the truth. So you have to be able to understand whether you can trust the information that another vehicle, who you don't know and don't have any reason to trust, is actually telling you valid information. They could be giving you incorrect speed, incorrect location, incorrect status information.

And so we figured out a way of using other sensors, mostly things like collision-avoidance sensors on vehicles, to make an assessment, an independent assessment, of either the location of that vehicle. So if you know your location and the person is giving you a message that tells you what they say their location is, but then you have a radar or lidar or something that allows you to locate them relative to you, you can validate whether that position that they sent you is accurate or not. Same with speed.

And so doing that, we developed a scheme. It was kind of a crowd-source scheme where a vehicle that

detected a message from another vehicle that appeared to be incorrect would then report to all of the other vehicles in the vicinity about the incorrectness of that message.

And by doing that, you could then begin to get a measure of the confidence of the integrity of the content of messages from that vehicle.

MR. WISNIA: I'm sorry. Can we just go off the record for one second?

(Off the record.)

MR. CHIPLUNKAR: Back on the record.

MR. WISNIA: Just for the record, the defense preserve any objection to the fact that the questioning attorney is not admitted yet in the case.

BY MR. CHIPLUNKAR:

Q Now, you used the term "NHTSA." What is that an acronym for?

A It's National Highway Traffic Safety Administration.

Q Thank you. And what is the Intelligent Transportation System you're talking about?

A Well, the Intelligent Transportation System is more of a concept than a system. Back in, I guess it was maybe 1991, the -- Congress passed something called the Intermodal Surface Transportation Act, often called ISTEA,

I-S-T-E-A. And as part of that, they mandated the allocation of a significant amount of money -- I can't recall exactly how much -- to research and study what was termed as the Intelligent Transportation Systems.

And what Intelligent Transportation Systems, or ITS, are is a system essentially that uses modern computing and communications and geolocation technology to integrate or to create a variety of different applications for all types of surface transportation. So this could be cars. You know, safety systems in cars acting unilaterally. It could be cooperative safety systems between cars. It could be commercial vehicle operations.

I've done a little bit of work with NHTSA in applying Connected Vehicle technology to things like unprotected rail crossings. So it's really dealing -- there was not a lot of involvement with shipping. Shipping like in ships on Marine Maritime navigation or Maritime transportation, but it was very heavily road and road interfaced with rail and applying modern computing communications location technologies to those problems.

Q So then you mentioned this Intelligent Transportation System project started sometime in '90, '91?

A Well, it was a -- there was a bill that was passed by Congress that funded Intelligent Transportation

Systems. There were a whole variety of projects that were -- that fell under the general umbrella of ITS. Some of them were funded by Federal Highway Administration. The DOT formed something called the Joint Program Office for Intelligent Transportation Systems that served as a clearinghouse for many of these programs.

And these programs -- you know, many of these started before the formal introduction of the term "ITS." There was a big project in Orlando in 1990, I think, 1989, 1990 that was dealing with car-to-car communication and car-to-roadside communication and navigation systems. And really the primary effort began around 1991 because that's when most of the funding became available.

Q And now this is still a concept, correct?

A Well, we did a lot of development projects. We did a lot of proof-of-concept projects. And, you know, in 1990 it was a concept. Today, many of these systems exist in the world. So we see it -- you know, changeable message signs on roads that we didn't have back then. We see things like bus -- using automatic vehicle location on buses. You can now get, you know, real-time displays at the bus stop of when the bus that you're looking for is going to arrive. All of these things fall under the general mantle of ITS.

Q How about collision avoidance? Is that -- is

that in this system implemented?

A Yes. So, you know, collision avoidance, I started -- that's how I got into ITS work, building collision avoidance systems for cars. And today, you know, you can buy a car that has various kinds of collision avoidance systems. Back in 1990, you know, it was all experimental.

Q But the existing collision avoidance system are just local to the car, correct?

A Not all of them. Some of them are infrastructure supported. There are different kinds of collision avoidance systems.

Q Can you give me an example of an infrastructure supported collision avoidance system.

A Sure. There are systems where the infrastructure senses the presence of a vehicle and the location of a vehicle and communicates that to other vehicles. These would be mostly, I think, large trucking operations, and probably some rail operations.

Most of the car collision avoidance systems are either using a sensor on the car to sense the presence of other vehicles or they are communicating from one car to the infrastructure or from one car to another vehicle.

One example is something we call signal phase and timing, which we have demonstrated a few times where

the infrastructure sends out information associated with the current phase of a signal at an intersection. And then the vehicles can use that to determine whether they're going to run the red light, which is a kind of collision avoidance. It's not necessarily -- it's kind of a preemptive collision avoidance to prevent you from getting into a situation where there might be a collision, as opposed to sensing the actual presence of another vehicle.

Q And now this is proof of concept, what you just explained, or is this --

A I think that system, it's evolved a little bit and they got away from transmitting -- well, except for buses and things, which they still do. They got away from transmitting the single phase and timing information and, instead, will generally make that available through servers. And so there are systems that will now tell you that the light is about to turn green and give you that information in your car, but it's getting it through a 5G connection.

Q Now, your company, Cogenia Partners, do they develop products?

A Not products that we would sell.

Q Do you write software? Does Cogenia Partners write software for collision avoidance systems?

A Well, we have -- I have written software for collision avoidance systems, not through Cogenia Partners. Cogenia Partners does write software now and then but primarily through proof-of-concept research and development for the USDOT.

Q And now these are the contractors that you hired to write the software?

A Yes.

Q You do not write the software.

A There have been times when I've written software. Mostly for timing and geolocation applications.

Q While you were at Cogenia Partners?

A Yes.

Q And what language did you use for writing the software?

A That was in C.

Q And what was the framework? What was the device you were writing software for?

A This was a -- it was a test and evaluation system that was meant to provide ground truth information for a vehicle. It's a little complicated. But you need to -- if you're going to test collision avoidance systems, you need to have a very accurate understanding of exactly where each vehicle is at a particular time.

And so the notion of time and time accuracy

between two vehicles that are not connected to one another directly and the location of those vehicles is really important because you don't want them to crash, by definition. You don't want to test the system by crashing cars or hoping that they don't crash and then discovering they do.

So we spent a great deal of time with Federal Highway Administration. This work was actually through Air, Inc., which is another prime contractor. Developing a system that provided extremely accurate time and location ground truth to these vehicles so that we could then have an understanding of exactly where the vehicles were and compare that with what their collision avoidance systems were telling them they were doing. So it was a way of providing an objective third-party measure of the performance of those collision avoidance systems.

Q So, and did you sell this product?

A Well, we were contracted by the Federal Highway Administration to develop this product.

Q And then who did you give this product to?

A Federal Highway Administration. There's a laboratory in -- at Turner-Fairbank Highway Research Center in Virginia that we built this system and left it with them.

Q And you built the system yourself.

A Well, me and my colleagues.

Q Contractors?

A I -- I built some portions of it. They built some portions of it. I can't recall exactly which screws I put in and holes I drilled. But I had -- my hands were in the actual production or building of that product.

Q Is this -- can I go out and can anybody go out and buy this product?

A We didn't manufacture it for public sale. It was developed under contract for Federal Highway Administration. What they did with it is their business.

Q Oh, so you don't know even if they used it or not.

A Not anymore. I mean, this was a while ago, so...

Q How -- how far back was this?

A This would have been 2013, 2014.

Q And was that the last time you wrote software for a collision-avoidance-system-related project?

A Probably, yeah.

Q Was that the last time you worked with any hardware for a collision avoidance system?

A No.

Q When did you most recently work with?

A That would have probably been about 2017 or so.

We were doing research testing on dedicated short-range radio systems. And so we had a large number of radio systems that we were wiring up and putting into test environments and testing their behavior.

Q Who made these radios?

A There were two sources. One of them was a company called Arata Systems. And the other was a company in Australia called Cohda, C-O-H-D-A.

Q And what protocol was being used by these venues?

A It was 802.11. What's -- what was at the time known as 802.11.P which was a special variant of the 802.11 protocol that we developed. I've worked on the standards committee for that. And the upper layers of the protocol were under what is 1609.2, 1609.3, 1609.4, and SAE J2735.

Q And you said the protocol was 802.11.P? 802.11P?

A 80.211.P. That's the IEEE protocol for the physical layer, the MAC layer, and all the way up to the application layer or actually up to the -- below -- just below the application layer where the IEEE 1609 specifications and the application layer message specification was SAE J2735.

Q And is that protocol -- is that used currently?

A It's the -- the standards route is still active. I don't know if people are actually implementing it or not.

Q Do you know if 802.11.P is used for collision avoidance?

A It would be used for vehicle -- the vehicle communications. So 802.11.P is a variant of WiFi. Uses a slightly different frequency and it eliminates the association process that you have where, you know, one station connects through an association process to an access point. Because when you're on the road, you're passing by an access point or another vehicle so quickly that you wouldn't spend time building a network.

Q And 802.11.P you said is a variant of 802.11.ABC?

A It would be -- 802.11, it would be -- closest would be 802.11AC.

Q And that's an 80 megahertz bandwidth?

A It's 75 megahertz bandwidth at 5.9 megahertz.

Q And that would be considered a narrow band system?

A That would be a -- I guess a fairly narrow band communication system, yeah.

Q Let me hand you -- this will be marked Exhibit 2004.

(Exhibit Number 2004 was marked for identification.)

BY MR. CHIPLUNKAR:

Q Now, do you recognize this as your CV from the Cogenia website?

A I'd have to go and see which version of my CV was on the website. But it's -- it is a version of my CV. I don't know exactly what the date is.

Q Do you know how current this is?

A I guess it's reasonably current. The projects -- Audi, that project settled maybe about six months ago. So this is probably at least six to eight months old.

Q Let me direct your attention to page 6 of this document, Exhibit 2004.

A Okay.

Q It's a listing of certain patents, correct?

A That's right.

Q These patents name you as one of the inventors?

A Yes.

Q Were there any coinventors on these patents?

A Some.

Q And some of these -- let me back up. So when was Cogenia Partners formed?

A 2001.

Q And so all of these patents, starting with 2001,

were they patents that were filed by Cogenia Partners?

A No.

Q Who filed these patents?

A It would have been either me, or me and a partner. Or a partner company that I was working with to develop them, and they're all three mixed in here. Would you like me to go through that?

Q You said "partner."

A Well, for example, Items 9 and 10, security for anonymous vehicular broadcast messages and digital certificate pool, those were filed by Nissan. And I developed the patent in collaboration with a Nissan employee. And they're assigned to Nissan.

Q Did you receive any money for assigning?

A No.

Q And was this patent generated as part of a project that you did for Nissan?

A It was a project dealing with Connected Vehicle technology for the Vehicle Safety Consortium which was a consortium of automotive companies that included Nissan.

Q Now, setting aside the two Nissan patents. So the patent that was, I guess, issued in 2010, who owns that patent?

A Is this System and Method for Computer Program Product for Sharing Information in a Distributed

Framework?

Q Yes.

A That is -- it is a patent that I wrote with a partner, Axel Fuchs, F-U-C-H-S, and we own a portion of that patent. We sold the rest of it to another company.

Q And which is this other company?

A A company called Stragent.

Q What does Stragent do?

A They're a litigation company.

Q What do you mean by "litigation company"?

A Stragent is a company that has a patent portfolio, and they litigate those patents in district court.

Q So they assert those patents?

A Yes.

Q So they are a patent consortium entity?

A Yeah, I think that's probably a fair way of representing that.

Q Okay. And whatever is on the list, the 2012 patent at issue in 2012, is that a continuation of the patent at issue in 2010?

A Yes. So 11-12-16 through 18 are all continuations or continuations in part of the original patent listed in Item 11.

Q And how about -- you skipped over some numbers

here. Are those different patents? 13? How about Number 13?

A These are all -- all of the ones from 11 through 18 are all part of the same family. They all share the same specification.

Q Okay. And they all have been -- you co-own them with Stragent?

A Yes.

Q Okay. And have these patents been asserted?

A Yes, they have.

Q And against -- who are these patents asserted against?

A I believe they have been asserted against BMW and Volvo and Mercedes.

Q And is the litigation ongoing?

A Some of it.

Q And has Stragent collected any damages?

A Yes, they have.

Q And they've shared the damages with you?

A Yes, not very much but some.

Q And then starting with 19, System for Location-Based Triggers for Mobile Devices.

A Yes.

Q Are you an inventor, sole inventor, or a coinventor on that patent?

A I'm a coinventor also with Axel Fuchs on the patent, and that is the same specification from Items 19 through 25.

Q And is this entirely owned by you and Mr. Fuchs or --

A It is entirely owned by two patent holding companies that we individually own. He owns one; I have another. So they go under -- the company that I own is called Sozo Innovations, and his, I believe, is called Inventerra. But we're the only members of each of those LLCs. And so that's how they're owned.

Q And are these two entities that you named, are they patent asserted entities?

A No, they are simply holding companies that own those patents, and they are being asserted by a different assertion entity.

Q And what's the name of this assertion entity?

A I think it's called Oso-something. I can't remember.

Q Are they currently being asserted?

A I believe so, yes.

Q Against what -- who are the defendants?

A The last one that I was aware of was Target.

Q Target?

A The shopping company.

Q Okay. And are these litigations ongoing?
A I believe so.
Q Okay. Have any damages been collected in these cases?
A Not that I'm aware of. No.
Q Okay. And you believe all these patents that you've written are all valid?
A Well, some of them have been invalidated. I mean, IPRs. That's why there are a lot of continuations. So I believe they're valid. I disagree with the conclusions. And at this point, I don't know at what number from Items 11 through 18, but somewhere in that process, we were able to prevail through the IPR process, and that's where the patents return back to district court and are being litigated.
Q Okay. Now, are any of these patents on this list related to collision avoidance?
A To some degree. The one in Item 6 is a patent, Japanese patent, that I wrote in conjunction with a person from Isesaki. It's a Japanese company that makes braking systems for Toyota. I wrote this when I was at Toyota, and I believe it's assigned to either Isesaki or Toyota. And what this was, was a system for very carefully controlled braking pressure in order to automatically stop or slow down a vehicle to avoid a collision.

Q Are any of these patents related to railway collision avoidance?

A Well, this one could be related to railway collision avoidance if the thing that you were going to collide with was a train.

The other one is Item 8 which is an intersection warning system. And this was an infrastructure supported collision -- warning collision avoidance and warning system where the traffic signal system at an intersection would look at the oncoming speed of approaching vehicles, and on the basis of its signal phase and timing, it would warn the vehicle that was approaching that it was approaching too quickly and wouldn't be able to stop in time to traverse the intersection safely. And it would also warn the other vehicles that were approaching from other directions that there was a vehicle that was about to run the red light.

Q So this was an intersection of -- like a street intersection?

A Street intersection or a railway intersection, sure. Any kind of an intersection where you have vehicles that are crossing paths and are potentially in danger of, you know, having intersecting trajectories.

Q And who owns this patent?

A That would be a Toyota patent.

Q Okay. And just does the word "train" or "railway" or "railroad" occur in any of these patents?

A I'd have to go look. It's been years. Some of these are 25 years old. I'd have to look at them. I don't -- I doubt it.

Q Do you know if the invention disclosed in this patent was commercialized?

MR. WISNIA: Objection. Form.

THE WITNESS: I don't know.

BY MR. CHIPLUNKAR:

Q Did Toyota implement this in any of their cars?

A I don't know. My job at Toyota was to come up with novel ideas for various kinds of advanced systems, and they do what Toyota does. It's not -- my job was not to commercialize it.

Q So you agree with me that a lot of times patents are written and they never get commercialized, correct?

A I would probably say most of the time, yeah.

Q Okay. I will hand you what will be marked as Exhibit 2005.

(Exhibit Number 2005 was marked for identification.)

BY MR. CHIPLUNKAR:

Q So this document that's been marked Exhibit 2005 says: Scott Andrews, expert witness. Is this referring

to you?

A Yes.

Q And is this a document that is available on Cogenia's website?

A Yeah, some version of this. I keep it reasonably updated. The one on the website is probably a little bit out of date but not by more than a few months.

Q Okay. So if you could turn to the second page, to the summary of cases. The first case is West View Research v. VWGoA. Were you representing the defendant in this case or the plaintiff?

A It would be Volkswagen Group of America. So I was working for a defendant.

Q So you were trying to invalidate the patent?

A Yes.

MR. WISNIA: Objection. Form.

THE WITNESS: Yes.

BY MR. CHIPLUNKAR:

Q On the second column, same row, there's Renaissance Unified Patents. Was -- this was an IPR, right?

A That's correct.

Q And were you representing the petitioner or the patent lawyer?

A The petitioner.

Q So you were providing opinions regarding -- to invalidate the patent, correct?

A That's correct.

MR. WISNIA: Did you say this thing was Renaissance? I'm looking at Rothschild. Do I have the same thing as you?

THE WITNESS: No, it's the second column. The right-hand column.

MR. WISNIA: Oh, I apologize.

MR. CHIPLUNKAR: And what was the result of this IPR?

THE WITNESS: I don't know.

BY MR. CHIPLUNKAR:

Q The second row is Rothschild Location Tech. v. Volkswagen/Audi. Were you the representing the plaintiff or the defendant?

A Defendant, Volkswagen/Audi.

Q Okay. And your opinions you were providing were used to invalidate the patent?

A Yes. This was a reexamine declaration. I don't know the outcome.

Q Okay. Same row, second column. This is an IPR. Were you representing the patent owner or the patent petitioner?

A Petitioner.

Q So you were providing an opinion regarding the invalidity of a patent, correct?

A Yes. That's correct.

Q Third row. It's case M-A-N-I-T-T-O Technologies v. Mercedes-Benz. Were you representing the patent owner or the plaintiff or the defendant?

A I was representing Mercedes-Benz, the defendant.

Q So you were providing an opinion to invalidate the patent.

A That's correct.

Q Second column, this is Proximity Monitoring Innovations v. Mercedes-Benz. Were you representing the plaintiff or the defendant?

A Defendant, Mercedes-Benz.

Q And you were providing an opinion to invalidate the patent, correct?

A Yes. That's right.

Q Do you know what was the result of this case?

A No. I only now and then get informed of the actual result.

Q Fourth row. West View Research v. Volkswagen GoA. Were you representing the plaintiff or the defendant?

A Volkswagen/Audi, defendant.

Q And you were providing an opinion to invalidate

the patent, correct?

A That's correct.

Q The second column, case M/A-COM Tech Holdings v. Laird Technologies. Were you representing the plaintiff or the defendant?

A I was representing the plaintiff, M/A-COM, so I was supporting validity arguments in that case and infringement.

Q And did that go to trial?

A We had hearings. I don't know what the actual -- I never actually participated in the trial, so I don't think so. Must have settled without trial.

Q Then the case Zoltar v. Samsung. Were you representing the plaintiff or the defendant?

A I was representing Zoltar, who was the plaintiff.

Q So you were -- you put in a report for the validity of the patent?

A Yeah, I don't know that I actually prepared a report in that case, but I was working on behalf of the plaintiff.

Q And the case TracBeam, LLC v. Cisco Systems. Were you representing the plaintiff or the defendant?

A It was Cisco Systems, the defendant.

Q So you were providing opinions regarding the

invalidity of certain patents?

A Yes. That's right.

Q Blackberry v. SNAP. Were you representing the plaintiff or the defendant?

A I was representing SNAP, Snapchat, who was the defendant.

Q So you were -- your opinions related to the invalidity of the patents, correct?

A Yes. That's right.

Q XOne Technologies v. Uber. Plaintiff or defendant?

A I was Uber, the defendant.

Q It says -- below that, there's no case name or number there. So I guess this is --

A I didn't know the case number.

Q So Unified v. Hailo, H-A-I-L-O. Were you representing the patent owner or the petitioner?

A That was the petitioner.

Q Okay. Unified v. Ride App, were you representing the petitioner or the patent owner?

A Petitioner.

Q Now, Unified Patents is an entity that goes around invalidating patents and IPR, correct?

A As far as I understand it, Unified is a membership organization. Companies subscribe to

1 participate in whatever it is that Unified -- services
2 that Unified offers, and one of the things that they do is
3 challenge patents that, I guess, have been litigated in
4 other venues. So they independently challenge them.
5 **Q So in these Unified cases that are here and are**
6 **listed, you always represented Unified.**
7 A Yes.
8 **Q So you've always been on the side of the**
9 **petitioner.**
10 A In the Unified cases, yes.
11 **Q Okay. And in these Unified cases, you were**
12 **providing opinions regarding the invalidity of patents,**
13 **correct?**
14 A Yes.
15 **Q Okay. I'm going to go to the last row here.**
16 **Location Based Technologies v. Uber. Were you**
17 **representing Uber or Location Based Technologies?**
18 A Uber, plaintiff -- or, excuse me, defendant.
19 **Q Okay. And then Erise Law. Case -- the case**
20 **name is Rideco v. Via Transportations. Was this an IPR?**
21 A There were IPRs associated with it, but I also
22 worked on the district court case.
23 **Q And was this -- were you providing opinions**
24 **regarding the invalidity of the patents there?**
25 A Yes, I was representing or supporting Rideco who

was the defendant.

Q So we can go through each one of them. Would you say you mostly provide opinions regarding the invalidity of patents?

A I would say the predominant work that I do is for defendants. Part of that is because after you start to work for car companies, the car companies don't usually sue other companies. They get sued. And so just by the conflicts that you accumulate, you are not going to work against companies that you've already worked for.

There are a handful of cases in here that I have worked on behalf of the plaintiff. I'd say it's probably about 5 percent.

Q So in 95 percent of the cases, you are providing opinions to invalidate a patent.

A That's correct.

Q Okay. So in this list, whenever it says "invalidity," you're basically putting in a report that -- providing opinions that the patent is invalid.

A Either a report or I'm supporting, you know, analysis that was ultimately aimed at invalidity. Not every one of these resulted in a report or a declaration.

Q If we could move -- change tracks here and move to your declaration, 1003-468.

Did you write this declaration?

A Large portions of it, yes. I can't say I wrote every word. But I reviewed and edited every word and wrote significant portions of it.

Q If you'd turn to paragraph 3 of this report.

A 3?

Q Yes.

A Okay.

Q So I guess that should be paragraph 2. Sorry. Paragraph 2. If you start at paragraph 2. So paragraph 2 to paragraph 10 of this report, you've set forth your personal and professional background, correct?

A Yes.

Q Now, if you want to quickly review those sections, I will have a couple of questions. Or those paragraphs, I mean.

A Okay.

Q Nowhere in those paragraphs do you reference collision avoidance for railroads, correct?

A Well, I did work on collision avoidance systems in some of these engagements, but not -- I haven't specifically referenced them as being railroad collision avoidance systems.

Q But in none of these projects you've called out collision avoidance for railroads, correct?

A Actually in none of these projects have I called

out collision avoidances, as far as I know. But I don't call out collision avoidance for rail projects in this very brief outline of my background.

Q In the resumé on Cogenia's website, do you recall calling out railroad collision?

A No.

Q Have you been on a train engine?

A You mean --

Q Locomotive.

A -- onboard a locomotive?

Q Yes.

A Not when it was operational.

Q Okay. Have you been on a maintenance-of-way vehicle?

A No.

Q You know what a maintenance-of-way vehicle is.

A Yes, I do.

Q Okay. Have you seen a collision avoidance system deployed on a railroad vehicle?

A I'd have to consider that. It depends on what kind of collision avoidance system. I've been on a lot of rail vehicles, and I'm curious about collision avoidance systems, so I'm aware of the sorts of things that are on them. And so I pay attention to that because I'm curious about it, but not in an official professional capacity.

Q So you -- but you've never been on a locomotive, correct?

MR. WISNIA: Objection. Form.

THE WITNESS: I've been on locomotives.

BY MR. CHIPLUNKAR:

Q Okay. And have you seen a collision avoidance system in the locomotive?

A No, I haven't.

Q Okay. So you haven't seen a collision avoidance system in a locomotive.

A No, I haven't worked on a collision avoidance system in a locomotive or on a locomotive. I have observed collision avoidance systems in operation as a passenger. Living in Japan, you see lots of trains and you spend a lot of time on trains. And so I've seen those sort of systems. So I've observed them, but I haven't worked on those systems as a professional.

Q So outside of being a passenger or -- have you seen a collision avoidance system on a train locomotive?

A Well, I guess I just answered that. As a professional, I haven't worked as a professional on a collision avoidance system on a train.

Q Okay. So --

MR. WISNIA: When you get to a good spot, we've been going for about an hour.

MR. CHIPLUNKAR: Yes. Yes. A couple more questions on this.

MR. WISNIA: Sure.

BY MR. CHIPLUNKAR:

Q So is it fair to say you do not have personal experience with railroad collision avoidance equipment.

A I have personal experience, a great deal of personal experience, with collision avoidance systems. Whether they're applied to rail, vehicles, trucks or ships, is kind of irrelevant. I have a lot of experience in collision avoidance systems. Haven't worked specifically on one that was mounted to a train.

Q So you do not have personal experience with a collision avoidance system for railroads; is that correct?

A Well, the collision avoidance systems that I've worked on could be used for railroads. So I have experience in collision avoidance systems that could be used for railroads. I have not put any of those collision avoidance systems on a railroad yet.

Q Can you give me examples of commercially available collision avoidance systems that you have worked on?

A Commercially available?

Q Yes.

A No, because most of the work I do is research-

oriented. So I've developed collision avoidance systems at 94 gigahertz for various applications. I've worked on collision avoidance systems for all kinds of vehicles in all kinds of situations, including rail crossings and other things. I guess I don't follow your question.

Q Were these commercial systems?

A Not at the time. They were all proof-of-concept systems.

Q Are they commercialized today?

A I don't know.

Q Okay. So you have not worked on a commercialized collision avoidance system.

A Well, the collision avoidance systems that are present on many of today's vehicles that are commercially available are all -- not all, but are primarily based on the technology that I developed with colleagues in the field back in the 90's, back when nobody was commercializing them.

So hard to say that I haven't -- I haven't worked directly on a product that was sold commercially. But many of the products that are sold commercially were based on work that I did with other colleagues prior to their commercialization.

Q Can you give me a name for this product?

A I don't know what the current names are, but

almost any of the Toyota adaptive cruise control systems or collision warning systems. I've worked on systems that are used by Ford. There are lots of systems that I have worked on that are progenitors of systems that are now commercialize.

Q And these were all for cars, correct?

A They were all for vehicles. We tested them primarily on cars. Cars and trucks.

MR. CHIPLUNKAR: Let's take a break. 10 minutes?

MR. WISNIA: Sure.

MR. CHIPLUNKAR: Let's go off the record.

(Recess taken.)

MR. CHIPLUNKAR: Welcome back. Did you discuss your testimony with counsel during the break?

THE WITNESS: No.

BY MR. CHIPLUNKAR:

Q Did you discuss your testimony with anybody else during the break?

A No.

Q Okay. Now, before the break we were talking about your experience with collision avoidance systems for railroad vehicles. You mentioned that you've seen it as a passenger in Japan; is that correct?

A Yes.

Q Okay. And you've seen it in museums?

A Well, I've been onboard locomotives in museums. You asked me if I'd been on a locomotive.

Q Yes. And that's the only time you've been on a locomotive, in a museum?

A There may have been other times, but in some kind in an observer capacity, not as a professional.

Q So the hands-on experience with rail equipment is as a passenger or seeing it in a museum?

A With rail equipment as in rail vehicles. My experience with collision avoidance systems is extensive, and it doesn't matter what vehicle it's on.

Q I'll reask my question. So your hands-on experience with rail equipment is limited to being a passenger riding one of these rail equipment train or seeming nem this a museum?

MR. WISNIA: Objection. Form.

THE WITNESS: Not completely. I've worked on technologies for supporting rail crossings. And so I'm familiar with railroad equipment in the context of how it interfaces with roadways, and developed conceptual systems and worked with the USDOT on systems that would provide collision avoidance warnings for vehicles as they approach rail crossings.

So to say I'm not familiar with railroad

equipment except in a sightseeing capacity I think would be incorrect.

BY MR. CHIPLUNKAR:

Q And now railroad crossing system -- what is the name of the system?

A It didn't have a name. We were exploring the application of ITS to all kinds of collision avoidance applications, including the interface between roads and rail and helping vehicles avoid collisions at rail crossings.

Q And you said you were exploring this idea?

A Well, all the work that I do involves developing system concepts and applying or assessing the technology and whether the technology can support that sort of system concept. Sometimes that's all paper studies, and sometimes it involves testing equipment, and sometimes it involves building proofs of concept. So, you know, sometimes it's just on paper.

Q Have any of these concepts that you were working on lead to a commercial railroad collision avoidance system?

A I don't know.

Q Okay.

A My job is not to commercialize these things.

Q But you do understand that for something to be

useful to the general public, it needs to be commercialized, correct?

A No, I disagree with that.

MR. WISNIA: Objection to form.

THE WITNESS: I disagree with that. It needs to be -- it needs to be developed. And at some point it needs to be commercialized, but it can't be commercialized unless it's developed. And it has to be developed. When no one has ever done it before, somebody has to do that.

BY MR. CHIPLUNKAR:

Q But sitting here today, you do not know if any of the concepts that you developed made it to a commercialize railroad avoidance system.

A That's not my job to know that. I'm not responsible for commercializing them.

Q Now, a patent owner in this case is a company called Metrom Rail.

A Okay.

Q Are you familiar with Metrom Rail?

A No.

Q Okay. Are you aware that Metrom Rail makes and sells collision avoidance systems?

MR. WISNIA: Objection. Foundation.

THE WITNESS: I'm aware of that from this case, yes.

BY MR. CHIPLUNKAR:

Q Okay. Are you aware that Metrom makes and sells a collision avoidance system under the another trade name Aura?

MR. WISNIA: Objection. Foundation.

THE WITNESS: No.

BY MR. CHIPLUNKAR:

Q So it is fair to say that you have no personal knowledge about the Aura system?

A No.

Q Okay. Do you know anything about the Aura system?

A Well, if I have no personal knowledge of the Aura system, then I wouldn't know anything about it, would I?

Q Are you aware that one of the petitioners makes a collision avoidance system called Helix?

A No.

Q So is it fair to say you have no personal knowledge about the Helix system?

A No. Yes, it's fair to say I have no personal knowledge.

Q Okay. Now, GPS or Global Positioning System, that has been around for a while, correct?

A Yes, since the late 80s.

Q Okay. And Ultra-Wideband has been also around for a while, correct?

A Yeah, maybe a little later than the GPS but not much.

Q And your opinion -- your opinion in these two IPRs is that all aspects of the claims in Exhibit 1001-468 and 1001-470 were previously marked, correct?

A Yes.

Q Yet you haven't cited to a single piece of prior art that discloses all the claimed features, correct?

MR. WISNIA: Objection. Foundation. Form.

THE WITNESS: No, that's not correct. I think the -- my declaration has the Grisham patent which stands alone. It's -- renders the claims -- all of the claims obvious.

BY MR. CHIPLUNKAR:

Q You're saying Grisham by itself renders all the claims obvious?

A I mean, not all of the claims. Sorry. It renders the independent claims obvious.

Q But Grisham does not anticipate the claims, correct?

MR. WISNIA: Objection. Form.

MR. CHIPLUNKAR: Strike that.

You haven't offered an opinion that Grisham

anticipates the claims, correct?

THE WITNESS: I think that's correct. I have offered the opinion that the Claims 111 and 14 of the 131 patent are obvious over Grisham.

BY MR. CHIPLUNKAR:

Q So no single reference anticipates the claims, correct?

MR. WISNIA: Objection. Form. Foundation.

THE WITNESS: I haven't provided an opinion that any of the R anticipates the claims.

BY MR. CHIPLUNKAR:

Q So for how long have you been active in the automotive field?

A Professionally or personally?

Q Professionally.

A Since 19 -- about 1991.

Q Okay. And that's 33 years, correct?

A Give or take, yeah.

Q And you have not seen an actual product in the railway space that has all of the claimed features of these patents, correct?

MR. WISNIA: Objection. Form. Foundation.

THE WITNESS: Has all of the features in all of the claims of the patents?

BY MR. CHIPLUNKAR:

Q Yes.

A A single reference?

Q A single product.

A I haven't looked at any products. I've only, in this case, looked at references.

Q But in your 30 years of experience in this field, you haven't come across a railway collision avoidance system that has all of the elements of the claims, correct?

MR. WISNIA: Same objections.

THE WITNESS: Hard to know, because, you know, in the last 30 years, I wouldn't have been looking at a system with the eye to whether it had all of the things that are listed in the claims, especially since this was not filed until 2011. So, you know, what -- it's an odd question because I'm not sure why I would be paying attention to whether something that I was looking at had all of the things that were listed in the claims, before the claims were put forward, and even before I was aware of the patent.

BY MR. CHIPLUNKAR:

Q In your 30 years experience, you haven't come across a railway collision avoidance system that used UWB and GPS, correct?

A Not that I'm aware of.

Q Okay. If you could turn to page 36 of Exhibit 1003-468. You see the section there, subsection 6, Ultra-Wideband Positioning and Sensor Technology including its use for ranging?

A Yes.

Q I will refer to Ultra-Wideband as UWB. Is that okay with you?

A That's fine.

Q Now, in this section, you discuss the concept of ranging using UWB signals, correct?

A Yes.

Q And what is ranging?

A It's determining the distance from the, in this case, the antenna of the sensor to an object.

Q And UWB uses a technique of ranging called Time of Flight ranging, correct?

A That's correct.

Q And UWB signals have short pulse durations, correct?

A Yes.

Q And because of that, they do not suffer from multipath defects, correct?

A Well, it's possible. They still suffer from multipath, but because of the short pulse lengths, it's

possible to disambiguate the original pulse from the reflective pulses.

Q And because of this particular feature of UWB, you can use a technique like Time of Flight ranging, correct?

A Well, most radars use Time of Flight ranging. So it's not because of this feature of the UWB that you can use Time of Flight -- you can use Time of Flight in all kinds of applications.

Q But because it has a shorter pulse duration, there's less ambiguity because of multipath, correct?

A Yes. And so it's -- UWB is more applicable to short-range, high-clutter environments where you might have a lot of multipath.

Q And UWB is immune to, for lack of a better word, multipath effects, correct?

MR. WISNIA: Objection. Asked and answered. Foundation.

THE WITNESS: It's not immune from multipath. It's possible to isolate the original reflective signal from the multipath reflective signals. There are still multipath reflective signals. It's just that the processing -- because of the pulse lengths, it's easier to separate the actual direct path signal from all of the other reflective path signals.

BY MR. CHIPLUNKAR:

Q Because the reflective path signal takes a little longer to get to the receiver, correct?

A That's correct.

Q And by then, it's no longer receiving.

A Well, by then you've already received the direct path signal.

Q Correct.

A So the reflective path signals don't fall on top of and confuse the direct path signal.

Q Okay. Now, at paragraph -- between paragraph 62 and 66, you describe UWB-based Time of Flight ranging, correct?

A Yes.

Q On page 39, that's between paragraph 63 and 64, you have a figure depicting two UWB radios, correct?

A Yes.

Q And to determine the distance between the two radios, you determine the round-trip time for a UWB pulse, correct?

A Yes.

Q So UWB Radio 1 transmits a pulse that's received by UWB Radio 2, correct?

A In this figure, yes.

Q And then UWB Radio 2 transmits a pulse that's

received by UWB Radio 1, correct?

A In this figure, yes.

Q Yes.

A It's possible to have Time of Flight where you are just receiving the originally-transmitted signal which I guess in this figure would be Pulse Series P1, and it is just simply reflected. It doesn't -- it's not retransmitted. So both kinds of applications are possible.

Q But in this figure, there are two UWB radios.

A That's correct.

Q Okay. And so after you determine the round-trip time for the UWB pulse, you divide the round-trip time by two, correct, to get the one-way time?

A Well, you have to -- in this particular figure, you have to subtract whatever the delay time is between the received time and the transmit time from the second radio.

Q Okay. And then you divide that by two?

A Yes.

Q And you divide it by two because it's twice the distance, correct?

A Yes.

Q Okay. And then you multiple by the speed of the wave speed what you call here. Correct?

A That's correct.

Q And that gives you the distance.

A That's correct.

Q Now, at paragraph 65, start -- the sentence beginning on page 40, you say, For example, the distance between two units can be measured at regular intervals in the manner I described above, period. By measuring the distance between the transceivers at regular intervals, it is possible to calculate the speed and direction of movement of the object by comparing the distances between the transceivers at different points in time.

A Correct.

Q So let's say you have two vehicles, each of which have a UWB transmitter and receiver, and at Time T Zero, you do the -- you transfer the UWB pulse. You receive it back. You apply this equation that -- the second figure and you determine that they're 1 kilometer apart.

A Okay.

Q And at some later time, you repeat the same process, and you determine that they are 2-kilometers apart.

A Okay.

Q Based on this information, can you tell me what is the speed of each of these vehicles?

A You can determine the relative speed between them. That's -- from that measurement alone, all you can determine is the relevant speed.

Q So you cannot determine the absolute speed of each of these vehicles just with that information, correct?

MR. WISNIA: Objection. Incomplete hypothetical.

THE WITNESS: If you only are looking at the round-trip time of a signal transmitted between the two objects, then you would be only able to determine the relative speed between those two objects.

BY MR. CHIPLUNKAR:

Q So if you go to paragraph 66 on page 40, I guess the last full sentence says, Change in distance over interval of time -- and a parenthetical, it says, Typically a very short period of time such that the straight-line motion can be assumed, closed parenthetical -- can be used to estimate the velocity over that interval. So that, you say, estimate the relative velocity over the interval, correct?

A Yes.

Q Okay. So the word "relative" is missing there.

A Yes.

Q Okay. If you could direct your attention to

paragraph 107, Exhibit 1003-468. Now, this is your analysis of Element 1B of Claim 1 of the 131 patent, correct?

A Yes.

Q And this analysis starts at paragraph 107 and ends at paragraph 110, correct?

A Yes.

MR. WISNIA: Objection to form. Foundation.

BY MR. CHIPLUNKAR:

Q And Claim Element 1B recites a transponder sensor module operable to send and receive data wirelessly, a transponder module comprising a first radio communication unit and a first antenna.

A Yes.

Q And at the end of paragraph 108, you say, a POSITA, P-O-S-I-T-A, would understand that these transceiver units are capable of both transmission and reception of data.

Do you see that?

A Yes.

Q Now, you've never identified any specific teaching in Grisham directed to the transmission and reception of data, correct?

MR. WISNIA: Objection. Form. Foundation.

THE WITNESS: So on paragraph 108, I said,

Grisham further explains and in some embodiments these units both transmit and receive and are known as transceivers. Grisham states, In a transceiver embodiment, substantial economy can be achieved by sharing all -- or part or all of several of the functions of the transmitter and receiver. Some of these include various other components he's talking about. That's at Column 17, lines 44 to 48 of Grisham.

BY MR. CHIPLUNKAR:

Q I see that it says that. You say a POSITA would understand that these transceiver units are capable of both transmission and reception of data.

A Correct.

Q Where in that paragraph do you discuss the transmission and reception of data? Strike that.

You do not discuss expressly the transmission and reception of data in that paragraph, correct?

A I don't discuss the actual transmission and reception of data. There's certainly the transmission and reception of signals, and later in the discussion of Grisham, in the claimed elements where we are talking about actually communicating, I do discuss that the data that is -- or that the transmissions occurring both directions and communication occurs in both directions, and that would imply that some form of data is actually

transmitted and received.

Q You said "that would imply"?

A Well, it's described that -- and we'll get to it, I'm sure. But there's a discussion in Grisham where he says that a person with one of the User Interfaces 1108, can communicate with and send messages to or send information to the other unit. So, clearly the system is able to transmit information in the form of data and receive information in the form of data.

Q My question is in paragraph 108. You do not describe the transmission and reception of data, correct?

MR. WISNIA: Objection. Asked and answered.

THE WITNESS: In paragraph 108, I am responding to the claim element which is a transponder. And I don't explicitly say that the transceiver, as described by Grisham, will send data in the context of that paragraph.

BY MR. CHIPLUNKAR:

Q Okay. If you could direct your attention to Exhibit 1001-468. That would be United States Patent 131.

A Oh, the actual patent?

Q Yes.

A Okay.

Q If you could turn to Column 7, line 63. Around line 63 in Column 7 it says, The VMM600 may transmit a variety of information to the CTU 630. For example,

1 **absolute position data, relative position data, and speed**
2 **data of the vehicle.**
3 **Do you see that?**
4 A Yes.
5 **Q Okay. You don't identify those types of data in**
6 **Grisham in the analysis of this element, correct?**
7 MR. WISNIA: Objection. Foundation.
8 THE WITNESS: This element doesn't specify what
9 kind of data would need to be sent. So, I don't.
10 BY MR. CHIPLUNKAR:
11 **Q Okay. Does this -- strike that.**
12 **Let's turn to Claim 11. And that analysis would**
13 **be in your report, Exhibit 1003-468, starting at**
14 **paragraph 128. Let me know when you're there, sir.**
15 A Okay.
16 **Q Just before we get into your opinion for this**
17 **system claim of Claim 1 -- well, strike that.**
18 **Claim 11 depends on Claim 1, correct?**
19 A Yes.
20 **Q And Claim 1 is a system claim that consists of**
21 **two rail vehicles, correct?**
22 A Yes.
23 **Q Okay. And Claim 11 recites a -- first a ground**
24 **speed detection module, correct?**
25 A Yes.

Q And now a ground speed detection module measures the speed of the railway, correct?

A It measures the speed of the vehicle relative to the ground.

Q And for your opinions of this element, you rely on Figures 13 and 14 from Grisham.

MR. WISNIA: Objection. Foundation.

MR. CHIPLUNKAR: If you could direct your attention to paragraph 129.

THE WITNESS: Uh-huh. Yes. I was just looking to see if I had those figures here, but I don't. No. So, yes, it's Figures 13 and 14.

BY MR. CHIPLUNKAR:

Q And at paragraph 129, you state: A POSITA would know that determining subsequent range calculations to a fixed location near the track would allow the calculation of ground speed.

Do you see that?

A Yes.

Q So in Figures 13 and 14, one of the vehicles has Grisham's module, and then the other Grisham module is on a control box that's stationary, correct?

A Yes.

MR. WISNIA: Objection. Foundation.

THE WITNESS: Yes.

BY MR. CHIPLUNKAR:

Q So this system of Grisham that you're relying on in paragraph 129 for detecting the ground speed, consists of a stationary Grisham radio and a Grisham radio on a vehicle, correct?

A For that particular configuration, yes. I don't think that Grisham would consider -- and I believe he talks about -- I'll have to look at it. But I believe he talks about the idea that you could have all of these simultaneously. So he separates them out in an application where one train is talking to another. Where the train is talking to a roadside, or a wayside box in this particular case, and another case where it's talking to a vehicle.

Q But you can determine ground speed using Grisham's method when one of the boxes is stationary, correct?

A That's correct.

Q If -- okay. And paragraph 130 that you say: In addition, it was well known that measuring range rate, then a parenthetical, changes in range over a finite time interval, close parenthetical, in order to determine speed as described above is only able to measure relative speed. Correct?

A Yes.

Q So if both vehicles are moving, you would only be able to measure relative speed using Grisham's method, correct?

A That's correct, and that's why you need to also measure your speed relative to something that isn't moving, which is the ground, so that you can get your ground speed.

Q And then you go on to say in the last sentence: Since by the priority date of the 131 patent, claims were known to include speed measurement devices.

Do you see that? The last sentence of 130?

A Yes.

Q You do not point to any specific speed measurement devices from a train, correct?

A No. Grisham gives you an example of one.

Q You don't cite to anything in Grisham there, correct?

A Well, I've just given the example that Grisham has a ground speed sensor that measures -- uses UWB to sense the relative speed relative to the ground. There may be other kinds of speed sensors on vehicles, but it was -- I think my statement here is that by 2011, it was known that trains had the ability to measure their speed. It had been taken for granted that they had some ability to measure their speed.

Q My question is in paragraph 130. You do not cite to any specific evidence in Grisham or anywhere else for these opinions, correct?

A It's really just the background knowledge that a person skilled in the art would have had.

Q So you're agreeing with me there is no citation to evidence in this paragraph, correct?

MR. WISNIA: Objection. Asked and answered. Form --

THE WITNESS: There is -- I'm sorry. Go ahead.

MR. WISNIA: Objection. Asked and answered. Form.

THE WITNESS: There is no cite other than the fact that it would have been obvious to a person of skill in the art by 2011 that trains had speed-sensing devices of various types.

BY MR. CHIPLUNKAR:

Q What are these various types? You don't have any examples of these different devices.

A No, because there are all different types, and a person of skill in the art would have understood that trains had the ability by 2011 to measure their speed in one way or another.

Q But there is no example that you provided here, correct?

A The example is that a person skilled in the art would have been aware of a variety of ways that trains would be able to use to measure their speed. That's why I refer to the knowledge of a person's skill in the art.

Q So is it your opinion that if there is no evidence, you can just point to the knowledge of a person of skill in the art.

MR. WISNIA: Objection. Misstates testimony. Foundation.

THE WITNESS: I don't have to go back to the first principles of geometry and cite to Euclid in order to describe that a person skilled in the art would have understood how to understand the geometry of calculating the speed based on a radar signal either. There are things that a person skilled in the art just knows because they have worked in the field, and you don't have to cite to every single one of those things.

BY MR. CHIPLUNKAR:

Q The claim is not claiming Euclidian geometry, correct?

A I'm giving that as an example.

Q The claim claims a ground speed module, correct?

A Yes.

Q And you are relying merely on the knowledge of a POSITA for that element, correct?

A Yes.

MR. WISNIA: Objection. Asked and answered.

THE WITNESS: In this case I'm not -- actually, no, I'm relying on Grisham and his example of using the Ultra-Wideband radar and the roadside or wayside unit to determine ground speed in Grisham. And here I'm saying it was also well known to measure speed in trains. So it's not something that would be unusual for Grisham to do, because people skilled in the art would have already known that you measure the speed of a train.

BY MR. CHIPLUNKAR:

Q But the embodiment that Grisham describes uses a stationary control box with one of Grisham's radios and a Grisham radio on a moving railway in Figures 13 and 14, correct?

A Yes.

Q And that's what you relied on in paragraph 129, correct?

A Yes.

Q Okay. Okay. You have not relied in paragraph 130 on any teaching from Grisham where both radios are on real vehicles, correct?

A No.

MR. WISNIA: Objection. Lacks foundation.

THE WITNESS: Where both radars on real

vehicles? No.

BY MR. CHIPLUNKAR:

Q Okay. If you could direct your attention to your analysis of Claim 14. It starts at paragraph 131, what has been marked as Exhibit 1003-468. Let me know when you're there, sir.

A Okay.

Q And Claim Element 14 recites, quote: The collision avoidance system of Claim 1 wherein the first radio communication unit is adapted to transmit and receive signals with varying center frequencies, closed quote. Correct?

A Yes.

Q Now, at paragraph 133 in your analysis, you state: That while Grisham's teaching is specifically directed at varying the pulse repetition rate, it is my opinion, given the teaching of Grisham above, that a POSITA would understand that UWB systems could be operated with variable center frequencies, period.

Do you see that?

A Yes.

MR. WISNIA: Objection. Misstates the record.

BY MR. CHIPLUNKAR:

Q So Grisham discloses varying the pulse repetition rate, correct?

A He discusses modifying the pulse duty cycles and other things in various ways. And pulse repetition rate is one of those ways.

Q Okay. And pulse repetition is not the same as changing the center frequencies, correct?

A I would say that it is an example of modifying the transmitted radio signal. It isn't necessarily changing the center frequency of the radio signal.

Q And that's why you rely on the understanding of a POSITA, correct?

MR. WISNIA: Objection. Foundation.

THE WITNESS: Well, in the latter part of paragraph 133, I cite to Exhibit 1005, which I don't remember what that is. It cites that there are different frequency bands that's well known to transmit in UWB at different frequency bands, especially using OFDM modulation.

BY MR. CHIPLUNKAR:

Q But Grisham does not disclose that technique.

A Grisham discloses modifying the various kinds of pulse modulation in the citation that I give at paragraph 4, line 61 through 5, line 12, and talks about a wide variety of waveforms. And then in Exhibit 5 I'm referencing a particular kind of waveform, which is OFDM, which was well known to have a variable center frequency.

Q So Exhibit 1005 discusses variable frequency band in your opinion, correct?

A Well, it discusses or it references that one kind of modulation that could be used or that is known to be used in Ultra-Wideband is what is known as orthogonal frequency division multiplexing, or OFDM. And that's -- since Grisham's already talking about various types of modulation, he says: Impulse radio can use many types of modulation, including amplitude modulation, phase modulation, frequency modulation, et cetera, and M-ary versions of these, M-ary being higher-level degrees of freedom in frequency division multiplexing, for example. OFDM is one example of that. And OFDM, as we'll see when we get into Suzuki, actually does end up with a variable center frequency in the OFDM waveform and the UWB waveform.

Q In paragraph 134 of your analysis, you say: It would be obvious to try a variable center frequency because it would allow more frequency diversity in the transmitted signal which, in some situations, is desirable.

Do you see that?

A Sure. 134 is separate from the discussion I have in 133. Are we moving to 134 now?

Q No, because you went back to 132. So I thought

you were looking at all these together.

A No. 134 is a separate point which is that it would be obvious -- you only have two choices and it would be obvious to try one or two choices.

Q Which in -- and using a variable center frequency would be desirable in certain situations, correct?

A Yes.

Q That's what you say?

A Yes.

Q You have not identified the specific situations in which it would be desirable; is that correct?

A In paragraph 134, no.

Q Okay.

A I do -- in paragraph 133 I talk about OFDM, which is one of the desirable ways of modulating UWB wavelengths.

Q But you do not identify in which situations using OFDM would be desirable, correct?

A No.

Q You just say it would be obvious to try because it might be desirable, correct?

MR. WISNIA: Objection. Misstates the record. Lacks foundation.

THE WITNESS: I say that it would be obvious to

try because it would allow more frequency diversity and transmitted signal, which in some situations is desirable.

BY MR. CHIPLUNKAR:

Q Okay. Grisham does not identify any problem with its pulse repetition rate method, correct? Strike that.

You have not identified any problem with Grisham's pulse repetition rate in your analysis of this element, correct?

A No.

Q Okay.

A I have identified that Grisham also says that there are a variety of other kinds of modulation that you could use. But he's not aiming those at solving any particular problem.

Q Correct. If you could direct your attention to the analysis of Claims 2 through 4.

A Starting at 136?

Q Yes, sir. So starting at paragraph 136, you have your analysis of Claim 2 of the 131 patent, and Claim 2 recites a Central Tracking Unit. Correct?

A Yes.

Q And it says: When the Central Tracking Unit is operable to track the location of at least the first vehicle-mounted module and the second vehicle-mounted

module.

Do you see that?

A Yes.

Q And for this particular element, you rely on a reference, Douglas. Correct?

A That's right.

Q And Douglas was marked in the IPRs as Exhibit 1011, correct?

(Exhibit Number 1011 previously marked.)

A Yes.

Q Okay. Now, if you could look at the patent -- the 131 patent that's Exhibit 1001-468, Column 9, and then if you go down line 63. Sorry. Apologize. Column 7 around line 63. It says: The VMM600 may transmit a variety of information to the CTU 630. Do you see that?

A Yes.

Q And CTU stands for Central Tracking Unit?

A I believe that's right. I'm not -- somewhere back here he introduces the term, but I believe that's correct. Yes.

Q And --

A Yes, Central Tracking Unit.

Q And the type of information that's communicated to the Central Tracking Unit includes absolute position data, relative position data, and speed data of the

vehicle.

Do you see that, sir?

A Yes.

MR. WISNIA: Objection. Incomplete hypothetical.

THE WITNESS: Yes, I see that.

BY MR. CHIPLUNKAR:

Q Those are examples of the type of information that the CTU in the patent includes, correct?

MR. WISNIA: Objection. Incomplete hypothetical. Form.

THE WITNESS: This is -- these are examples of information that may be transmitted by the VMM to the CTU.

BY MR. CHIPLUNKAR:

Q And this is the type of information that can be use to track or locate the location of a vehicle?

A Could be.

Q Okay. I'm going to hand you what was marked Exhibit 1011 in the IPRs that Douglas referenced. Now, you allege that Douglas teaches the claimed CTU, correct?

A Yes.

Q So looking at -- if you can turn to Douglas page 9 -- it's page 9 of 23 marked at the bottom of the page.

A Okay.

Q Do you recall that Figure 7B and 7C reflect the kind of information in Douglas?

MR. WISNIA: Objection. Vague.

THE WITNESS: The kind of information in Douglas. What do you mean by that?

BY MR. CHIPLUNKAR:

Q The Douglas -- Claim 11 -- sorry. Strike that.

Claim 2 requires a Central Tracking Unit, correct?

A Yes.

Q That tracks the location of the vehicles, correct?

A Yes.

Q And you rely on Douglas as disclosing a Central Tracking Unit that tracks the location, correct?

A Yes.

Q Okay. Does Figure 7B reflect the type of information that you allege is used to track the location of the vehicles?

A Figure 7, it's certainly at least a portion of that information, yes. It's describing the train link IDs which are described in Figure 7A and the particular tracks that the vehicle is traversing and what direction they're moving.

Q And it is your opinion that, given the track and

the direction, you can tell where the train is located?

MR. WISNIA: Objection. Incomplete hypothetical.

THE WITNESS: Well, he's giving -- actually in Figure 7B, he's giving link IDs and tracks. And so if you look in Figure 7A, each track is broken into individual links which have IDs. And so you would be able to locate the train, or at least that portion of the train, to the resolution of the size of the link that the train was on.

BY MR. CHIPLUNKAR:

Q And once it has traversed that link, what happens to this table? The train disappears?

A No, the table would be updated with the next link that the train was on.

Q Which would be what?

A Which would be what? It would be a new version of the table with the link IDs updated to represent the current position of the train.

Q And in your opinion, knowing the link ID is -- knowing which link it is on is good enough to satisfy this claim limitation.

A Well, there's no accuracy requirement in the claim. It just needs to know what the location of the train is, and the location is that it's on this particular link. The train is a big object, right? It isn't a

point.

Q Right.

A So it's going to take up some amount of space and, in fact, I think it takes up several links. Not just one. You are being told which of the segments of track it is located on.

Q So a link interconnects two different tracks, correct.

A No. A link, as I understand it, is a --

Q Can you look at Figure 7A?

A Yes. So in this particular example, the link represents a connection between two of these tracks. Let me read 7A text first. So in his example, he's identifying the links that connect between different tracks.

Q So do you know what an interlocking is in the railway context?

A I believe it would be that you cannot switch two different directions at the same time. So you -- you have switches that only allow you to set the path of the train along one set of tracks, so you can't switch the train in two directions -- sections.

Q Switch the train in two directions?

A Switch the tracks in two different directions.

Q So Douglas is directed to making sure that you

are not switching the tracks or links incorrectly, correct?

MR. WISNIA: Objection. Incomplete hypothetical.

THE WITNESS: He is seeking to -- the part that we care about here and Douglas is that you have the central unit that is keeping track of which paths the trains are on so that you don't end up with two trains on the same path.

BY MR. CHIPLUNKAR:

Q If you could look at Figure 7D. What does the conflict mean in that table?

A That would mean that you have a potential situation where two trains could be on the same track.

Q Is that what "conflict" means?

A Let me go back and double-check, but I believe that's what that means, yes.

So it says that in his description that it is seen that -- this is Column 9, beginning around line 14. They're seeing that there's a conflict with respect to the links, 104, 116, 118 as the links 104, 116, and 18 are required to be in an "on" state and an "off" state at the same moment. As the conflict is detected for the links, the apparatus may alert the drivers of the trains as the trains shall encounter at least each one of the links. So

essentially what I just said, you'd have two trains that are going to be traveling on to the same link at some point, or might travel onto the same link, and you need to warn the people that that could happen.

Q Is that what a conflict means, that two trains could be on the same link?

A It says that the links are in a conflicting state.

Q What does "conflicting state" mean?

A It says that they're required to be in an "on" state and an "off" state at the same moment. So what he means by "on" -- so an "on" link would mean that a train is expected to traverse that lane, and an "off" state would mean that it is not. And so if you are expecting one link to be both on and off, it can't be both. And so that's the conflict.

Q Okay. So Douglas's Central Tracking Unit tracks the conflict strength of the links, correct?

A On the basis of the trains that are expecting to travel on those links, yes.

Q Expected to travel on those links, correct?

A Yes.

Q So Douglas is tracking the expected location of those trains on those links, correct?

A Well, he also describes that trains are known to

be on a particular link, not the links that they're expecting to use.

Q So what is your understanding of a link?

MR. WISNIA: Objection. Asked and answered.

THE WITNESS: We've already talked about that. But he talks about it as the linkage between multiple tracks. So he's got this Figure 7A, and he's describing a series of tracks with essentially switching links between tracks. And so his various links are the track segments that link one track to another.

BY MR. CHIPLUNKAR:

Q How long are these links, in your opinion?

A Depends on the geometry of the tracks.

Q So are these links longer than the train?

A I wouldn't care to speculate. They're however the person has -- has laid out the tracking and switching yard has decided the links need to be.

Q So knowing a link that a train may traverse on, doesn't tell you the exact location of a train, correct?

MR. WISNIA: Objection. Form.

THE WITNESS: Well, that is what's happening in Figure 7D. But I think Douglas is fairly clear that -- so 7C is the link to be traversed by the trains and --

MR. CHIPLUNKAR: Can I stop -- sorry to interrupt. So the links to be traversed, correct?

THE WITNESS: That's --

MR. WISNIA: Hold on.

THE WITNESS: That's 7C.

MR. WISNIA: Hold on. Let him answer the question before you -- because he's in the middle of an answer. The record is going to be unclear. So let him finish the answer to the question. So can you read back the previous question and let him finish it, please?

(Record read back.)

THE WITNESS: So each of the Trains, 126, 128, 130, and 132 -- this is Column 8, starting at line 21. To broadcast a signal comprising unique identification of the respective train and a unique identification of a track the train is moving on.

So, for example, Train 126 shall broadcast periodically the signal comprising its unique identification, 126, and the unique identification of the track, 90, that the train is moving on. And in the -- in an implementation, the signal transmitted by the train may also include the direction of the Train 126.

So he is referring to the Central Tracking Unit keeping track of the tracks that the trains are on and the links that they are planning to move on to.

BY MR. CHIPLUNKAR:

Q The links that they are planning to move on to,

correct?

A Yes.

Q Okay. So it keeps track of the track ID, Douglas's CTU, correct?

A It keeps track of the track ID and the direction of motion. And from Figure 7A, you can tell where on the track the train is located, because it's moving to that next link that it's planning to take.

Q And these tracks can be many, many miles long, correct?

A Well, the train can be many miles long too. The tracks are not necessarily -- the links are not necessarily many miles long, because you wouldn't have a switching yard that would take up hundreds of square miles.

Q The track ID that you mention is the track that the train is traveling on, correct?

A Yes.

Q And the link is the one that it's going to take when it's going to change tracks, correct?

A That's right.

Q Right. And the track ID is the identification of the track that the train is currently on. Correct?

A That's right. And the link that it's about to traverse is -- where the link and that track ID intersect

is the approximate location of the train.

Q So you're telling me that the link and the track ID, that that gives you the location of the train at that point in time.

A It gives you the location of the train with enough resolution that you can then make decisions in Douglas about how to configure the links and whether you have a potential conflict.

Q Is that the information that's used to determine if there's a conflict?

A Well, if the -- if the two trains are planning to traverse -- are expecting the links to be in different states -- let's suppose we have a train on Track 100 and a train on Track 98. And there's a train that's approaching on Track 98, and it is expecting Link 114 to be off, because it's going to pass Link 114 and it doesn't want another train to hit it, and there's a track on -- or a train on Track 100, and it's expecting Link 114 to be off because it's planning to switch from Track 100 to Track 98, that's a conflict. And knowing that there's a train that's approaching Link 114 on Track 98 and another train that's approaching Link 114 on Track 100, tells you the location of those two trains certainly relative to Link 114.

Q But you need to know well in advance that

there's a conflict, correct?

A Yes.

Q To avoid a collision, correct?

A Yes.

Q So the trains are not close to the link, correct?

A They are close to the link from the perspective of determining what the state of that link should be from a train context. I mean, they're close to that link in terms of the distances that matter for trains. If they were thousands of miles away on Track 98 and 100, you wouldn't care. And the claim doesn't make any assertions about the degree of accuracy that's required in knowing the locations of these trains. You need to know them accurately enough that in a train context you can avoid a collision between them. And that's as accurately as it needs to be known.

Q Does the patent -- in your reading of the patent, the 131 patent and the 227 patent, does the 131 patent or the 227 patent make reference to link IDs or track IDs that some information that is stored in its CTU?

A I don't think so.

Q Okay. But we -- and we can refresh your recollection, but the 131 patent does disclose that its CTU keeps track of relative speed and absolute speed and

absolute location, correct?

A In the example given in the specification.

Q And the examples given in Douglas do not discuss keeping track of absolute speed, relative speed, or absolute location. Correct?

A I'll have to go and look in the rest of Douglas to see. But Claim 2 doesn't require that the accuracy of the location -- first of all, it doesn't require anything other than location. So all of the examples of speed and other things are irrelevant to Claim 2. And so on top of that, it doesn't require any particular level of accuracy in the determination of that location. Doesn't specify it.

MR. CHIPLUNKAR: Can you please reread my question, Madam Court Reporter?

(Record read back.)

MR. CHIPLUNKAR: Can you answer that question, sir?

THE WITNESS: The examples in Douglas? You'll have to give me a minute until I review the rest of them, as I wasn't relying on that part of it because the claim doesn't require it. Well, he describes at Column 8, starting at line 30: The Transceiver 34 of each of the trains 126, 128, 130, 132 within a range receives the signal broadcasted by each other train.

For example, Transceiver 34, the train receives the signals broadcasted by Trains 128, 130 to 132. The received signal is analyzed at the processor of the apparatus of each of the trains, 126, 128, 130, 132, to extract the unique identification of each other train and the unique identification of the track each other train is moving on.

From the extracted information, it is determined at the processor of each of the trains, 130 -- 126, 128, 130, 132, if the track of the train receiving the signal and any of the other trains within the range is the same.

So he doesn't explicitly say that they have the -- that they broadcast the position of the train, but they -- there's an assumption here that all of the trains are in range. Which means you know that they are within some distance of this system of Douglas and, therefore, you now need to be careful about which links you're going to activate so that you can avoid collisions.

MR. CHIPLUNKAR: Madam Court Reporter, can you please reread my question?

(Record read back.)

THE WITNESS: I would say that there's no discussion in Douglas that I have found that relates to absolute or relative speed. There does appear to be at least some information in Douglas related to the absolute

position of the trains relative to Douglas's switching system. Because the trains have to be within a range that is defined by Douglas as being relevant so that you know the trains are not a thousand miles away. You know that the trains are within some specified distance, and when they're within that distance, they now fall under the control system of Douglas.

BY MR. CHIPLUNKAR:

Q How big is the zone in Douglas?

A He doesn't say the claim doesn't specify.

Q I'm asking you what Douglas -- does Douglas specify the size of the zone?

A I don't think he actually specifies a number, but he talks about a range.

Q So it could be a few kilometers, the range of the zone?

A I don't know that he specifies what the range is, but then neither does the claim, so...

MR. CHIPLUNKAR: I think we're at 11:45. Let's go off the record.

(Recess taken.)

MR. CHIPLUNKAR: Back on the record.

BY MR. CHIPLUNKAR:

Q Welcome back. Did you discuss your testimony with your attorneys during the break?

A No.

Q Discuss your testimony with anybody else during the break?

A No.

Q Okay. If you could direct your attention to paragraph 153 of Exhibit 1003-468.

A Okay.

Q And starting at paragraph 153, you set forth your analysis regarding the invalidity of Claim 10. Correct?

A That's right.

Q And that opinion goes all the way to paragraph 156, correct?

A Yes. That's right.

Q Now, Claim 10 depends on Claim 1, correct?

A Yes.

Q And Claim 10 recites wherein the first vehicle-mounted module executes an adaptive threshold feature that modifies one or more vehicle separation thresholds based on a speed of the first rail vehicle and the speed of the second rail vehicle. Correct?

A Correct.

Q And your opinion is that Grisham, in view of McDaniel -- reference Exhibit 1015 -- teaches or renders this claim obvious, correct?

A Yes.

Q Now, you rely on McDaniel's teaching for threshold warning distance, correct?

A That he has a threshold warning distance that modifies the separation threshold based on vehicle speed.

Q Now, if you look at what you quoted from McDaniel, paragraph 0038 --

A Yes.

Q -- it says: Once the closing rate has been determined and the velocity data has been received, a velocity D2 associated with Target Object 130 may be estimated.

Do you see that?

A Yes.

Q So McDaniel, to do its adaptive threshold feature, requires that it know the velocity of both the vehicles, correct?

A Yes.

Q Now, you've not pointed to anything in McDaniels that teaches the determination of the absolute velocities of both the vehicles, correct?

MR. WISNIA: Objection. Foundation.

THE WITNESS: Well, actually, paragraph 38 teaches how you, knowing the relative speed between Vehicle 1 and Vehicle 2, which is listed here as R, sub R,

and knowing the velocity of Vehicle 1, which from Claim 1 or one of the other earlier claims would have -- I should say that Grisham describes as being determined using UWB looking at a wayside unit. If you know V1 and R, Sub R, you can determine V2. So now you know the velocity of both of the vehicles.

So McDaniel does not teach I don't -- at least I haven't cited to anything where he teaches how you determine the velocity of the first vehicle. But if you know the velocity of the first vehicle, which you would with Grisham, and you know the relative velocity between the two vehicles, you can determine the velocity of the second vehicle.

BY MR. CHIPLUNKAR:

Q So in your combination, you are relying on Grisham Figure 13, where there's a wayside control unit and a Grisham radio? Is that your combination?

A Well, I'm relying on the fact --

MR. WISNIA: Objection. Foundation.

THE WITNESS: I'm relying on the fact that Grisham teaches that you can determine the ground speed of the vehicle, or of the first train, by measuring the speed relative to the ground. And then you can also determine the speed of the vehicle relative to the leading vehicle. And if you know both of those McDaniel teaches, then you

can determine the speed of the second vehicle and then based on that, decide what the threshold is going to be.

BY MR. CHIPLUNKAR:

Q So there are three UWB radios in this combination: The wayside radio, the radio on the first train vehicle, and the radio on the second train vehicle?

A I think you would only necessarily need to have one. Be the radio on the first vehicle, which you could use to measure your speed relative to the ground and you could use that same radio to measure the speed relative to a vehicle ahead. You could also have three radios. Doesn't really matter. Depends on whether you're using a reflected signal or whether you're using a retransmitted signal.

Q What does Grisham use?

A Grisham uses -- he uses a retransmitted signal.

Q Okay. So to use a retransmitted signal, you would need multiple radios, correct?

A You would need three different radios.

Q Okay. So in your combination, you have a wayside unit that -- a wayside unit and a main Grisham unit on one main vehicle and a second Grisham unit on the second vehicle. Is that your opinion today?

MR. WISNIA: Objection. Form. Foundation.

THE WITNESS: So, let me look back at Grisham.

1 You could certainly do it that way. You know, knowing
2 what I know about UWB, that's how Grisham describes it.
3 And so if you relied strictly on Grisham and not on what a
4 person skilled in the art would know, then, yeah, you
5 would need three radios.
6 BY MR. CHIPLUNKAR:
7 **Q And where in your analysis of Claim 10 have you**
8 **set forth your understanding of this three-radio**
9 **combination?**
10 MR. WISNIA: Objection. Form. Foundation.
11 THE WITNESS: Well, the fact that I'm relying on
12 Grisham to render Claim 1 obviously means that we're using
13 Grisham's system, which we have established determines the
14 speed of the -- relative speed of the vehicle ahead
15 through successive measurements of distance and is able to
16 determine the ground speed. And so what I'm saying is
17 that McDaniel shows the use of that, of those
18 measurements, to determine the speed of the second vehicle
19 and then using the speed of both vehicles to determine an
20 adaptive threshold.
21 BY MR. CHIPLUNKAR:
22 **Q Where Grisham discloses several embodiments,**
23 **correct?**
24 A Yeah.
25 **Q Does Grisham disclose an embodiment where there**

are three radios involved in determining the velocity?

A Grisham discloses multiple embodiments, all of which could be used individually or collectively.

Q Could be used. You recognize -- you've done this several times -- that for obviousness you have to show that a POSITA would use that, correct?

A Sure.

MR. WISNIA: Objection. Misstates the law -- sorry. Objection to form.

THE WITNESS: The fact is that Grisham describes individually different applications. He doesn't describe that only one of those applications could be used at a given time. So he has an Ultra-Wideband radio on the train, on the primary train, and he describes that a vehicle equipped -- in this case, a car -- equipped with an Ultra-Wideband radio would be able to be warned if the train was coming. And he can use the same radio on the train. And there is a locomotive ahead with an Ultra-Wideband radio, and you can warn each other of the relative distances. And you can do the same thing with a work zone vehicle.

I don't think that any one -- any person skilled in the art would read Grisham that you are only able to do one of those applications at a time. There's no requirement in Grisham, for example, that if you wanted to

do a vehicle warning system and a rail warning system that you would have to have two of these systems simultaneously side by side. So you'd have to have two radios on the main train. I think it's clear that you could have a single radio on the main train and it can talk to different versions of Ultra-Wideband radios on the wayside and other vehicles or in another train.

BY MR. CHIPLUNKAR:

Q Does Grisham disclose an embodiment where there are three radios involved in determining the absolute speed of the vehicles?

A Do you have a copy of Grisham?

Q Sure. This is previously marked as Exhibit 1006 in both IPRs. Sir, I handed you what is marked Exhibit 1006. Can you confirm that this is United States Patent 6,759,948?

A That's correct.

(Exhibit Number 1006 previously marked.)

Q And you've relied on this reference?

A Yes. So a good example is Grisham's Figure 15. And he describes this right around -- or, sorry, not 15. 17. Describes this starting at Column 21, line 59. And here, he's talking about an application where there's a radio on the train. There's a radio in a roadside control box, and there's a radio on a vehicle. And in this case a

car that's crossing the tracks.

And so in that situation you have three radios, and you can use, as he's described in the first one, to determine the speed of the train relative to the control box in that particular embodiment. And you can use it to send a signal -- first of all, sense the presence of a vehicle on the tracks and then send a signal to warn that vehicle.

So that's an application of Grisham that involves three radios. And determining the speed of the vehicle relative to the roadside and identifying the potential collision with another vehicle. That other vehicle in this application is not a train, but it could be a train. Just his particular example, it's another vehicle.

Q So it's not a train. So there's no -- this embodiment doesn't have two trains, correct? You agree with me?

A Yes.

MR. WISNIA: Objection. Foundation.

THE WITNESS: It doesn't have two trains. It has three radios. And one of them is on a train, one of them is on the roadside, and the another is in another vehicle. The fact Grisham has examples that involve two trains and examples that involve one train and the

1 roadside unit, I don't think it's a hard stretch to
2 imagine a person skilled in the art understanding that you
3 could create -- that Grisham describes a variety of
4 different applications, and one of those applications
5 could be using two trains and a roadside unit.
6 BY MR. CHIPLUNKAR:
7 **Q And then you add McDaniels to it.**
8 A You add McDaniels to that in order to understand
9 the variable threshold associated with measuring the speed
10 to the vehicle.
11 **Q Why do you need McDaniels then?**
12 A Because Grisham doesn't describe variable
13 thresholds based on the relative speeds of these vehicles.
14 **Q So you're just relying on McDaniels for the**
15 **adaptive feature?**
16 A Yes.
17 **Q Okay. And where in your analysis of Claim 10**
18 **have you set forth an opinion that a POSITA would use the**
19 **teaching of the figure in Grisham that you were**
20 **referencing and McDaniels?**
21 A I don't explicitly call out which embodiment of
22 Grisham. I say on page -- in column -- excuse me.
23 Paragraph 156: Grisham already collects speed and
24 distance data, modifying them to implement an adaptive
25 threshold figure, would have been a routine and simple

change by a person skilled in the art.

Q What do you base your opinion that it would be routine on? You have some evidence to say that it's routine?

A Well --

MR. WISNIA: Objection. Form.

THE WITNESS: I've already shown that Grisham -- through my analysis of Grisham, I've already shown that Grisham is able to measure the speed of the vehicle. Able to measure the relative distance and speed of the vehicle ahead. So a person skilled in the art would not have a difficult time understanding that he teaches collecting speed and distance data and then using an adaptive threshold feature, as taught by McDaniel, would be a relatively straightforward thing to do.

BY MR. CHIPLUNKAR:

Q I'm going to go and mark -- I'm going to hand the witness what was previously marked Exhibit 1015 in both IPRs. Is this McDaniels?

A Yes.

(Exhibit Number 1015 previously marked.)

Q And in your analysis of McDaniels in your report, in your declaration, you haven't specified that McDaniels is applicable in the railway concept, in the railway context, have you? In your opinion, in your

declaration.

MR. WISNIA: Objection. Form.

THE WITNESS: I don't know that McDaniel -- well, let me take a quick look at it. But I think he's looking at this mostly in the collision warning, collision avoidance application. And I think we've already established that the applicability of collision avoidance is -- for trains is not substantively different from the collision applicability or application of collision avoidance technologies for vehicles. In fact, trains represent a simpler case than vehicles in a collision avoidance context.

So he doesn't -- to answer your question, I don't think McDaniels talks about using collision avoidance or providing collision avoidance for trains specifically. But as I said, I think a person skilled in the art would understand that collision avoidance technologies for vehicles can be applied to trains.

BY MR. CHIPLUNKAR:

Q Does McDaniels reference UWB?

A No, I don't believe he does, but he doesn't need to, because we're only rely on his teaching of an adaptive threshold distance which is irrespective of the technology used to determine what the distances of speeds are.

Q So you said in your testimony just now that

we've established that there's no substantive difference between collision avoidance in the railroad space and collision avoidance in the vehicle space. Correct?

MR. WISNIA: Objection. Form.

THE WITNESS: Well, I established that in my declaration.

BY MR. CHIPLUNKAR:

Q But you have no firsthand knowledge about collision avoidance in the railway space, correct?

A I have a great deal of knowledge about collision avoidance between vehicles, and I understand enough about trains to understand that trains operate in a geometric environment which is substantially simpler than the application for roadway vehicles or surface vehicles.

So the application of collision avoidance technology in the rail industry or to a rail application is going to actually be a simpler application than it would be for surface vehicles or, excuse me, road or nonrail vehicles.

Q And yet in your 30 years of experience, you haven't seen a collision avoidance system in the railroad concept.

MR. WISNIA: Objection. Foundation.

THE WITNESS: I've seen hundreds of collision avoidance systems for all kinds of vehicles. Not one

specific for rail.

BY MR. CHIPLUNKAR:

Q Okay. In paragraph 156 in your analysis there, you say -- second sentence, paragraph 156: A POSITA would have understood. And then you go on to make an assertion about the understanding of a POSITA.

Do you see that?

A Yes.

Q And do you support that understanding with any evidence? Strike that. I withdraw that question.

You do not cite to any evidence for that understanding here, correct?

MR. WISNIA: Objection. Foundation. Form.

THE WITNESS: Well, I think a person skilled in the art would have understood that you can have situations where trains may be on adjacent tracks and may be only feet from each other, and yet they don't represent a collision hazard because their trajectories are limited and they -- unless those trajectories cross, there can't be a collision.

So I don't know that I would need to provide a formal reference to illustrate that a person skilled in the art would understand that trains traveling within feet of each other on parallel tracks that don't intersect, would not represent hazards to one another.

BY MR. CHIPLUNKAR:

Q Okay. I'll reask the question. You agree with me that for the assertion you make in the second sentence, you do not cite to any evidence, correct?

MR. WISNIA: Objection. Asked and answered. Foundation.

THE WITNESS: I cite to what a person skilled in the art would have understood about trains and tracks and collisions.

BY MR. CHIPLUNKAR:

Q What do you cite to?

A A person would have understood -- so I cite to what a POSITA would have known. There's a lot of background knowledge that people carry with them, and I don't have to cite to a separate reference for every single assertion that I make. If I understand what a person skilled in the art would have known, I can rely on that. Would have been obvious to someone that that would be the case.

Q Next sentence: A POSITA, thus, would have been motivated to incorporate McDaniels' variable threshold warning system and stopping distance calibration feature of vehicle collision avoidance integrations collision avoidance system in order to accurately and effectively avoid collisions when railway vehicles are approaching at

different speeds of braking conditions and to avoid nuisance alerts for the operator of the safe approach or close proximity of the other trains.

Do you see that sentence?

A Yes.

Q Again, this is just your understanding, correct?

MR. WISNIA: Objection. Misstates the record. Foundation.

THE WITNESS: It is, I think, apparent that if you -- and especially in this case, this is understanding from a deep background in collision avoidance systems that the threshold at which you would warn, which would be a distance, depends on the speed that you're traveling. And so anyone who's worked in collision avoidance systems understands that and understands that having an adaptive warning distance that depends on the relative speed of the objects that may collide is an appropriate way to --

MR. CHIPLUNKAR: Right.

THE WITNESS: -- to do that.

BY MR. CHIPLUNKAR:

Q So, you have a situation where you have two tracks running next to each other, correct? Are you with me?

A Yeah.

Q You have a train on Track A and a train on Track

B.

A Okay.

Q Approaching each other.

A Right.

Q One is on Track A and the other one is on Track B. Is there any chance that they're going to collide?

A If you know what tracks they're on, no.

Q How does this adaptive collision help in such a situation? Have you articulated -- isn't that a nuisance that you're trying to avoid? That's a nuisance, correct?

MR. WISNIA: Objection. Compound. Form.

THE WITNESS: Yes. So if you are traveling next to a train that's moving the opposite direction, and you determine that your distance is not changing, even though they're traveling in the opposite direction, you would know that they are on a parallel track traveling in the opposite direction.

BY MR. CHIPLUNKAR:

Q Their distance is not changing though they are approaching each other? Is that your testimony?

A Once they have encountered one another, their distance doesn't change.

Q The adaptive threshold feature is set there before they arrive at each other, correct?

A Yes.

Q So when they're far apart and they're approaching each other on different tracks, this adaptive McDaniels feature would cause the warning to start sounding, correct?

A It might do that, yes.

Q Isn't that what you're relying on McDaniels for?

A I'm relying on McDaniels to provide a warning that is based on the relative speed of the two trains, and the distance that it warns at is based on the relative speeds of the two trains.

Q Yes. Have you completed your answer?

A Yes.

Q So if two trains are approaching each other on different tracks and you implement McDaniels, you are going to get a nuisance alert. Correct?

A Not necessarily. It depends on how you measure the relative change of speed and the relative change in distance and the speed of the two vehicles. You can actually do the geometric calculation to recognize that the speed is not changing -- or, excuse me -- that the distance is not changing at a rate commensurate with the speeds. Let me try to reexplain that.

If the two trains are traveling -- let's suppose you have two trains that are not in exactly adjacent tracks, because it's easier to understand, but they're

traveling on tracks that are a few tens of meters apart.

Q No.

A Well, let me give my example. And the point is that if they're approaching one another, as they approach at infinite distance you would not be able to tell whether one was headed directly toward you or was going to miss you. But the closer they get, the more you can look at the fact that the speed of each train is different than the approaching speed between the trains. The relative or -- the relative speed between the trains at some point is going to be zero when they're next to one another. Right? And yet, they're both still moving at whatever speeds they were moving at.

So there's -- it's possible to differentiate the fact that even though you see that the other train is approaching you, it's not going to hit you because the relative speed between you and that other train is inconsistent with the distance between you and that other train.

Q So two trains running on adjacent tracks, next to each other, traveling in opposite directions, you're telling me McDaniel teaches how to discriminate whether they're on the same track or on different tracks?

A No.

Q That's just what a POSITA would know, in your

opinion. Correct?

A Sure.

Q Okay. Is that articulated anywhere? Is that taught anywhere?

A No, because it's what a person skilled in the art would have understood.

Q Because you don't have a reference, a person of ordinary skill yet would have understood. Correct?

MR. WISNIA: Objection. Argumentative. Watch your tone with the witness, please.

THE WITNESS: I've explained what my understanding of what a person skilled in the art would have understood. I didn't feel that it was necessary to support every single piece of understanding and background information a person skilled in the art would have with a separate reference.

BY MR. CHIPLUNKAR:

Q You have got a statement here that says: In order to accurately and effectively avoid collisions when rail vehicles are approaching at different speeds and to avoid nuisance alerts. Do you see that "nuisance alerts"?

A Yes.

Q Implementing McDaniels in a railroad scheme where two trains are approaching each other on different tracks, do you agree would create nuisance alerts?

A No. I don't think it would.

Q Why not?

A Because McDaniels offers different thresholds for different speeds and different warning thresholds for different speeds. So if I have a particular closing speed, and I know the two speeds -- I'm trying to explain this, but I don't think you understand it.

I know the speeds of both vehicles and I know the relative closing speed and I'm going to implement a warning threshold based on the distance between them that's a product of all of those speeds, I would be able to differentiate when these two trains are not actually approaching each other at -- in a way that they would collide, because I know all three speeds. I know the relative speed and I know the individual speed of each one.

Q And your opinion is that a POSITA would know how to discriminate whether a train is on the same track or on an adjacent track.

A Yes.

Q Okay. Let's look at your opinions regarding Claim 7 which is starting at 176. Paragraph 176.

A Okay.

Q Sorry. It starts at -- my apologies. It starts at paragraph 173.

A Okay. I'm there.

Q Claim 7 recites the Global Positioning System unit operable to receive information from one or more satellites.

Do you see that?

A Yes.

Q And Grisham does not disclose GPS, correct?

A I don't believe so, no.

Q You rely on a reference called Nixon for the teaching of GPS, correct?

A That's correct.

Q And I'm going to get to paragraph 176. Paragraph 176, you provide a portion of your opinions for the motivation to combine. Do you see this?

A Uh-huh. Yes.

Q Paragraph 176 starts on -- halfway on page 98 and goes all the way to the top of page 100. Correct?

A That's right.

Q And you agree with me that for all the assertions that you make there, there is not one citation to any piece of evidence of those assertions. Correct?

MR. WISNIA: Objection. Foundation. Form.

THE WITNESS: I think all of these citations are, again, to the background information that a person skilled in the art would have known. They would have

known that Ultra-Wideband radio is relatively limited in power and relatively limited in range. And if you have a substantial distance between two trains and you need to be able to stop one of the trains in time, that Ultra-Wideband radio or Ultra-Wideband radar is not going to necessarily detect that train at a great enough distance to allow you time to warn the train. And so an alternative way of doing this would be to determine what the position of the train was, based on GPS, and use that to determine whether or not you have a potential collision.

BY MR. CHIPLUNKAR:

Q On page 99, towards the bottom, you say -- well, it's actually -- it starts with: A POSITA would have also understood that trains often operate in rail yards.

Do you see that sentence?

A Yes.

Q So I'll repeat it. A POSITA would have also understood that trains often operate in rail yards where the trains may be in close proximity to one another but on different tracks.

Do you see that?

A Yes.

Q Okay. In this situation, using only a UWB radar -- what's a UWB radar?

A It's an Ultra-Wideband radar.

Q Does Grisham disclose a UWB radar?

A Of a type, yes.

Q So Grisham discloses a UWB radar?

A Well, it's a UWB radio that's used for ranging, among other things.

Q So does Grisham use a UWB radar or a UWB radio?

A He uses a UWB radio and he performs both ranging and communication with it.

Q Okay. Is a UWB radar different from a UWB radio?

A Not substantially. I mean, a UWB radio is a more general thing. It depends on what your application is. You can use -- a UWB radio is something that generates Ultra-Wideband signals. You can use a UWB radio for communication. You can use it for radar. You can use it for both, depending on what you do with the signals that you receive.

Q How does Grisham use it?

A He uses it for both.

Q He uses it as a UWB radar?

A And as a UWB radio or communication system.

Q Okay. So when used as a UWB radar, there is some problem here. Is that your opinion?

A Yes. And I think I probably didn't say -- state

this as clearly as possible. But the ability, using radar, as we just discussed with McDaniels, is going to be more limited in terms of its ability to discriminate different tracks than if it's GPS, because GPS you have a good understanding of what your trajectory is and you would be able to -- without having to do the geometry calculations that I talked about with McDaniel, you would be able to determine in advance that you were on two different tracks.

Q So if you know the GPS location of two different trains, how do you know that they're on two different tracks?

A Well, two different ways. One of them is that many of these applications talk about having a track database, so you know what the track -- where the tracks are. The other way is simply to look at the trajectory of multiple GPS fixes over time and you can see what the path of that train is geographically and you can see what the path of the other one is, and you know that those two paths don't cross.

Q Does Nixon -- do you describe some kind of track database in Nixon here?

A No.

Q Okay. And you say that in a train yard, the trains may be in close proximity. Do you see that?

A Yes.

Q So you're saying the motivation to use GPS is when they're in close proximity, you're able to use GPS to discriminate that they are on different tracks. Is that your opinion?

A Yes.

Q Okay. And how do you know -- if I give you two GPS coordinates and there's no -- you agree with me that -- strike that.

You agree that there's no disclosure of a track database in Nixon that you cite to, correct?

A I think that's correct. If you have a copy of Nixon, I'd like to see it.

Q Okay. I'm handing the witness what was previously marked Exhibit 1016. It's a PCT application W003/009254. The first named inventor is Nixon, Jim Russell.

Did I read that correctly?

A I'm not sure if Nixon describes it here. I was thinking he described it here. It doesn't state it specifically. So where were we?

(Exhibit Number 1016 previously marked.)

Q Can you go to page 1 of Grisham -- sorry. Can you go to page 1 of Nixon, Exhibit 1016?

A Sure.

Q I guess it should be page 2. Do you see the background of the Invention section?

A You mean page 3?

Q Oh, I guess it is page 3.

A PDF page 3.

Q Page 3, yes.

A Yes.

Q So Nixon -- what is the environment that Nixon is describing the invention?

A He describes it as what he calls a severe environment in dense -- bush covered with snow. Snowmobile operator may not avoid a collision with another snowmobile that approaches at high speed. So he is talking about essentially providing collision avoidance in a very densely-crowded environment where you may not be aware of the potential collisions until they are nearly upon you. And then he describes later that it's applicable to a wide variety of applications. I can't remember where that is but...

Q So --

A Trains and cars and other things.

Q Are you done with your answer, sir?

A Yeah.

Q Okay. So the background of the invention, Nixon says: With increasing popularity of new type of personal

vehicles such as snowmobiles, all-terrain vehicles, and watercraft, it has been important to establish technology for collision avoidance.

Do you see that?

A Yes.

Q It does not mention normal vehicles, correct?

MR. WISNIA: Objection. Form. Foundation.

THE WITNESS: That's why I'm looking because I recall him -- I think I recall him saying that it was applicable to a variety of other types of applications. Not just ATVs. But, go on.

BY MR. CHIPLUNKAR:

Q So in that list there, it's talking about all-terrain vehicles and watercraft, correct?

A In that list, yes.

Q Yes. And the motivation that Nixon provides for the invention is that in a dense bush covered with snow, a snowmobile operator may not avoid collision with another snowmobile approaching at high speed do you see that?

MR. WISNIA: Objection. Foundation. Form.

THE WITNESS: Yes.

BY MR. CHIPLUNKAR:

Q Do you see that on page 3 of Exhibit 1016?

A Yes.

Q Okay. And, similarly, in a severe environment,

it is difficult for the operators of any kind of vehicle as well as pedestrians, dogsleds, horse sleighs, or cross-country skiers to be aware of impending danger due to collision?

Do you see that?

A Yes.

Q Nowhere does it mention railcars, correct?

A In that section.

Q Okay.

A If you give me a minute, I'll find the place that it does. So on page 6, which is PDF page 8, it says: The trail alert equipment can be applied to any kind of vehicle such as an airplane, a boat, a ship, a train, a snowmobile, and an ATV.

Q So this is what a POSITA would use to combine -- to determine that you would combine Nixon with Grisham to improve Grisham's train avoiding system?

A Yes.

MR. WISNIA: Objection. Lacks foundation.

THE WITNESS: Yes.

MR. WISNIA: Incomplete hypothetical.

BY MR. CHIPLUNKAR:

Q Continuing on to paragraph 177. You say: One of the most common positioning system with a critical date was GPS. And a POSITA would have known that GPS systems

pair well with UWB systems and that GPS can make up for the shortfall of UWB by providing heading and other information useful, such as the path of the train, two trains, safety systems, period.

Do you see that?

A Yes.

Q Okay. And, again, this is just based on the knowledge of a POSITA.

A Yes.

Q Okay. There's no -- you don't have a reference that tells you how to pairs these up, correct?

A Well, you would combine -- I guess there are two answers to that. One is that you would use the combined information from both of them. In terms of how you would pair that up, that is actually fairly common knowledge to a person skilled in the art.

There are many systems that make use of dual location-sensing technologies and merge the two. For example, very common to combine Dead Reckoning with GPS, and the reason for that is that the error characteristics of GPS is different than the error characteristics of Dead Reckoning.

Same thing would apply with Ultra-Wideband. GPS gives you a fairly accurate large-scale picture of where things are. And the closer you get, or the smaller a

distance that you care about in terms of positioning accuracy, the less accurate GPS becomes. And so having a very high-precision positioning character or positioning system like UWB or distance determination system like UWB, would allow you to both identify errors in GPS and correct those errors. So that having GPS that has very good absolute position with not particularly high resolution, combining that with a positioning system or with a location-determining system like UWB that has very poor global positioning capability but very good local positioning capability, would make a lot of sense. That's all I'm saying here.

Q Yeah. But you've not cited to a reference where it's suggested that you would fuse UWB data with GPS. Correct?

A Only because a person familiar with positioning and navigation systems and inclusion of wind systems would have understood that.

Q You haven't cited to a reference that teaches or suggests the benefit of fusing UWB data with GPS data; is that correct?

A I've not cited to a specific reference for that, yes.

Q Sure. In fact, between paragraph 176 -- well, between 176 and 177 you've not cited to any reference

other than the knowledge of a POSITA, correct?

A That's correct.

Q Okay.

MR. CHIPLUNKAR: Let's take a break for maybe 10 minutes.

(Recess taken.)

MR. CHIPLUNKAR: I have no more questions for the witness. Thank you. Thank you for your time, sir.

THE WITNESS: Thank you.

MR. WISNIA: Okay. Why don't we take another short break here, and then I think I'll probably have -- well, let's go off the record.

(Recess taken.)

MR. WISNIA: On the record.

CROSS-EXAMINATION

BY MR. WISNIA:

Q Sir, I'd ask you to take a look at Exhibit 1011. It's the Douglas reference that you were speaking with counsel about earlier, correct?

A Yes.

Q Is your understanding of links in this document that links are still a portion of the track?

A Yes.

Q And there was some discussion about location and

distance that were being asked of you by counsel. Did you have a further chance to review Douglas?

A I did.

Q Are there any further additional portions of Douglas that you'd like to discuss?

A Yes. Actually, during lunch I read through some more of Douglas and I think it is clearer if you look at Claim 7, which basically says, the first element of Claim 7, reading an indication of a link that would follow in a course of motion of a respective train prior to a predetermined distance of the respective train from the link.

And what that means is that when the train is some predetermined distance from that link on whatever track it was on, that's when Douglas starts to consider that links that it might be associated with, so it knows where the train is at that point.

Q Okay. I'd ask you to take a look at Column 8, lines 41 to 51. Read that to yourself and I'll have some questions for you, sir.

MR. CHIPLUNKAR: Counsel, can you repeat the --

MR. WISNIA: Column 8, lines 41 to 51.

THE WITNESS: Okay.

BY MR. WISNIA:

Q What is your understanding of that portion of

Douglas?

A In Douglas, if the trains are on the same track, then there's a risk that they may collide and you have to -- Douglas will then provide some kind of a warning. And if they are on different tracks, then there's no risk of colliding because they're on different tracks.

Q Okay. So counsel earlier was asking you some questions that had to do with some hypotheticals related to trains coming at each other but on parallel tracks. Do you recall that?

A Yes.

Q What is your understanding as to how Douglas would deal with such a situation?

A If it knew that the trains were on different tracks, it would do nothing.

Q And what happens if they were on the same tracks?

A Then as they came close to one another, it would warn them.

MR. WISNIA: I have no further questions. I pass the witness.

MR. CHIPLUNKAR: I just have a few questions.

FURTHER EXAMINATION

BY MR. CHIPLUNKAR:

Q Counsel -- sorry. Sir, you relied on the Douglas reference for Claims 2, 3 and 4, correct?

A I'd have to look. Yes. That's correct.

Q And you relied on a different reference for Claims 7 and 8. Correct?

A Yes.

Q And, in fact, you relied on the McDaniels reference for Claims 7 and 8. Right?

A In 131?

MR. WISNIA: Counsel, maybe you're misspeaking.

MR. CHIPLUNKAR: Okay.

THE WITNESS: I relied on Nixon.

MR. CHIPLUNKAR: Nixon. Sorry.

THE WITNESS: Grisham and Nixon.

BY MR. CHIPLUNKAR:

Q And that's when we were discussing this point about discriminating between two different tracks, correct?

MR. WISNIA: Objection. Foundation.

THE WITNESS: It was primarily I think in McDaniel that we were discussing two different tracks, being Claim 10.

Q Okay. And in that combination for Claim 10, you do not rely on the Douglas reference, correct?

A That's correct.

Q Okay. So the teachings of Douglas are irrelevant to your opinion regarding Claim 10, correct?

A Other than I think they teach the fact that something that a person with skill in the art would have been aware of which is that trains that are on different tracks -- if trains are on different tracks, they won't collide. Doesn't take a reference to know that.

Q But you do not rely on Douglas for your opinions regarding Claim 10, correct?

A That's correct.

Q Okay. And you do not rely on Douglas for your opinions regarding Claims 7 and 8, correct?

A That's also correct.

Q Okay. And during the break, did you talk to counsel regarding Douglas?

A No, I actually read that while you were all out of the room while I was waiting to go to lunch.

Q Did you discuss your testimony at break with counsel, before counsel started asking his questions?

A Which break?

Q The last break.

A I brought it up that I wanted to talk about that.

Q And did you provide counsel with the questions

that you wanted to be asked?

A I don't recall, but I pointed out to him that I had identified within Douglas this predetermined distance.

Q And the portion of Douglas that counsel asked you questions about, do you recall citing those portions in your expert declaration?

A No, I don't think I did.

MR. CHIPLUNKAR: Okay. I have no more questions.

MR. WISNIA: Okay. I think we're off the record. Read and sign.

(Deposition concluded at 1:47 p.m.)

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STATE OF CALIFORNIA
COUNTY OF SAN DIEGO

I, Darla Kmety, a Certified Shorthand Reporter, hereby certify that the witness in the foregoing deposition was by me duly sworn to tell the truth in the within-entitled cause;

That said examination was taken down in shorthand by me, a disinterested person, at the time and place therein stated, and that the testimony of the said witnesses was thereafter reduced to typewriting, by computer, under my direction and supervision;

I further certify that I am not of counsel or attorney for either or any of the parties to the said deposition, nor in any way interested in the events of this cause, and that I am not related to any of the parties hereto.

This Day 1st of September at San Diego, California.

Darla Kmety, CSR 12956

DECLARATION UNDER PENALTY OF PERJURY

Case Name: Siemens vs. Metrom Rail, LLC.

Date of Deposition: 08/28/2023

Job No.: 10125462

I, SCOTT ANDREWS, hereby certify under penalty of perjury under the laws of the State of _____ that the foregoing is true and correct.

Executed this _____ day of _____, 2023, at _____.

_____

SCOTT ANDREWS

NOTARIZATION (If Required)

State of _____

County of _____

Subscribed and sworn to (or affirmed) before me on this _____ day of _____, 20__, by_____, proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Signature: _____ (Seal)

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Name of Witness: Scott Andrews
Date of Deposition: 08/28/2023
Job No.: 10125462
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2. To conform to the facts.
3. To correct transcription errors.

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SCOTT ANDREWS

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