UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

Investigation of:	*	
FATAL AMTRAK DERAILMENT NEAR JOPLIN, MONTANA ON SEPTEMBER 25, 2021	*	Accident No.: RRD21MR017

Interview of: MICHAEL PIRATO, Deputy Staff Director for Track
Federal Railroad Administration

MANAL BISHR, Director of Technical Research and Development,
BNSF Railway

ADAM MILLER, General Director of Maintenance Support
BNSF Railway

MICHAEL TROSINO, Deputy Chief Engineer of Track
Amtrak

Beach Grove, Indiana

Wednesday,
November 17, 2021

From: Trosino, Michael
To: Hipskind Richard
Subject: RE: Panel Interview Transcript & Instructions
Date: Monday, December 13, 2021 9:12:51 AM
Attachments: image001.png

Going through my interview notes, I have a some corrections:

Page 46 line 2 its not “municipal” train operation it is “Unit Coal” train operation
Page 46 line 5 “indiscernible” is Perryville
Page 46 line 11 “PNW is P and W (Providence and Worcester)
Page 47 line 2 “A&S” is NS
Page 48 line “Axle”
Page 49 line 7 “to the acellular” is via a cellular
Page 49 line 12 Supervisor, and the ADE
Page 49 line 14 Get Alarms or Alerts there is action required by a written procedure, which is
Page 50 line 16 I think you meant “Million”
Page 51 line 3 “its feeds” should be at speeds that exceed class 6, at the time class 6 was the top track class. They permitted operation at speeds exceeding class 6 and they placed the fright operation restrictions on our operation.
Page 52 line 4 “butt” is mud spots
Page 52 line 10 “flood” is flaw
Page 55 line 2 “flood is flaw
Page 57, line 11 “units” is limits
Page 57 line 18 “probation” is perturbation
Page 59 line 4 “NAC” is NEC
Page 59 line 16 “air” is Amfleet

Michael Trosino
Deputy Chief Engineer Track
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From: Hipskind Richard <hipskir@ntsb.gov>
Sent: Saturday, December 11, 2021 4:30 PM
To: [redacted]
Cc: [redacted]

APPEARANCES:

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QUINN LIGON, Track Safety Inspector
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TODD ANDERSON, Track Safety Inspector
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MATTHEW HAMMOND, AVP and Chief Engineer
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ROY MORRISON, Director of Safety
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RYAN RINGELMAN, General Director of Systems Safety
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I N D E X

I N T E R V I E W

MR. HIPSKIND: Good afternoon, everybody. My name is Dick Hipskind and I am a railroad accident investigator for NTSB and I am assisting Troy Lloyd, who is the Track and Engineering Group chairman for NTSB for this accident. We are conducting this panel interview with four panel interviewees on November 17th, 2021, at Amtrak's Beach Grove facility in Beach Grove, Indiana. This panel interview is part of NTSB's efforts in conducting a series of follow-up interviews to understand Amtrack passenger train operation on a host railroad, specifically Burlington Northern Santa Fe.

NTSB and the parties to the investigation are conducting an ongoing investigation of an Amtrak Train Number Seven derailment that occurred on September 25th, 2021, on BNSF's Highline Subdivision near Joplin, Montana in Liberty County. The NTSB Accident Reference Number is RRD21MRO17. Before we begin our interview and questions, let's go around the table and introduce ourselves. Please spell your full name and please identify who you are representing and your title. I would remind everybody to speak loudly and clearly enough so we can get an accurate recording. I'll lead off and then I'll ask for other interviewers to identify themselves according to the order previously established. Again, my name is Dick Hipskind, spelling of my full name is D I C K H I P S K I N D. I am a railroad accident investigator for NTSB on this accident.

MR. SOUTHWORTH: My name is Jim, J I M, Southworth, S O U T H W O R T H, I am the investigator in charge for the Joplin investigation. I work in the Railroad, Pipeline, and Hazardous Materials out of Washington, DC.

MR. HIPSKIND: Quinn?

MR. LIGON: My name is Quinn, Q U I N N, Ligon, L I G O N, I am a track safety inspector, I work for FRA.

MR. HIPSKIND: Todd, will you put yourself on the record?

MR. ANDERSON: Todd Anderson, T O D D A N D E R S O N, FRA track safety inspector, Bismarck, North Dakota.

MR. HIPSKIND: And Robert?

MR. NAGEL: Robert Nagel, R O B E R T N A G E L, senior manager of Capital Construction, Amtrak.

MR. HIPSKIND: And Matt?

MR. HAMMOND: Matthew Hammond, M A T T H E W H A M M O N D, I am the AVP and chief engineer for BNSF Railway on the North Lines.

MR. HIPSKIND: (Indiscernible).

MR. MORRISON: Roy Morrison, R O Y M O R R I S O N, director of safety, Brotherhood of Maintenance of Way.

MR. LLOYD: My name is Troy, T R O Y, last name Lloyd, L L O Y D, I'm a railroad accident investigator and the group -- and the Track Group chairman for this accident and I work for the NTSB.

MR. HIPSKIND: Okay. Thank you, the interviewers. In addition, before I get to the interviewees, we have two other

people hosting.

Would you please identify yourselves, spell your name, and who you represent?

MS. ALBERS: Anna Albers, A N N A A L B E R S, I'm from -- manager of Maintenance and Compliance from Amtrak.

MR. RINGELMAN: Ryan Ringelman, R Y A N R I N G E L M A N, systems safety, BNSF Railway.

MR. HIPSKIND: To all the interviewers, thank you. Prior to recording our panel interview, I spoke with the four interviewees to request their permission to record our discussion today and to talk with each other using our first name.

Has there been any change to your affirmation to those conditions?

Hearing none, let us proceed. So, let us proceed with introductions in the order we agreed upon earlier.

Mike, if you will lead off?

MR. PIRATO: My name is Michael Pirato, M I C H A E L P I R A T O. I'm the deputy staff director for Track, Federal Railroad Administration.

MR. HIPSKIND: And while we're talking with you, Michael, do you wish to have a representative with you today?

MR. PIRATO: Yes.

MR. HIPSKIND: Yes, you do?

MR. PIRATO: Yes, YuJiang.

MR. HIPSKIND: YuJiang, would you come down here and put

yourself on the record, spell your name, your title, and who you represent -- who you work for.

MR. ZHANG: YuJiang Zhang, Y U J I A N G Z H A N G, staff director of Track and Structures Division at FRA.

MR. HIPSKIND: All right, and Adam and Manal, would you please introduce yourself?

MS. BISHR: Manal Bishr, M A N A L, last name is B I S H R, I am the director of Technical Research and Development out of Topeka, Kansas for BNSF Railway.

MR. HIPSKIND: And Adam, please?

MR. MILLER: Adam, A D A M, Miller, M I L L E R, general director of Maintenance Support, BNSF.

MR. HIPSKIND: Okay, and Manal and Adam, do you wish to have a representative with you today?

MS. BISHR: No.

MR. MILLER: No.

MR. HIPSKIND: All right, thank you.

And Mike, please introduce yourself?

MR. TROSINO: Michael, M I C H A E L, Trosino, T R O S I N O, deputy chief engineer of Track for Amtrak.

MR. HIPSKIND: And do you wish to have a representative with you today?

MR. TROSINO: Yes.

MR. HIPSKIND: John, would you please come down here and put yourself on the record?

MR. BONVENTRE: Yes, my name is John, J O H N, Bonventre, B O N V E N T R E, outside counsel, Amtrak.

MR. HIPSKIND: All right, thank you, John.

And Michael, if I can get you and Manal to change places so we can get an accurate recording. I will begin our questions with you.

(Crosstalk)

INTERVIEW OF MICHAEL PIRATO

BY MR. HIPSKIND:

Q. Are you ready, Michael?

A. Sure.

Q. Okay. For the recording of our interview, please give us a synopsis of your work history, bringing us up to your current position and how long you have held it?

A. Well, I worked 30 years at the Southeast of Pennsylvania Transportation Authority before retiring from there, then I joined the FRA as a track inspector -- rail safety inspector track inspector. And from there, I moved to become the supervisory railroad safety specialist for FRA, and I am currently now the deputy staff director of Track for FRA, and I've had this position since May of this year.

Q. And Michael, is it fair to say that your current position is national in scope?

A. Yes.

Q. Okay, thank you. And please describe for us your duties and

responsibilities in your current position?
A. Current -- right now, I deal with the track inspection forces for the FRA based out of eight districts. So, the district specialist who have day-to-day operations with the railroad safety inspectors, they report to me.
Q. Okay. Big territory, a lot of people?
A. Yeah.
Q. All right. Well, Michael, what we want you to do is put up on the table the FRA 213.57 curves and speed limitations. And you can just take us through the highlights that you think that the average layperson would need to know in understand, the Vmax formula, maybe some of the terminology, and just give us your thoughts about that particular regulation?
A. Well, 213.57 talks about curve, speed, elevation, and designs. It moves into a -- it basically lays out the language that we use in our compliance manuals for elevating the outside rail above the low rail to counteract centrifugal force. There are certain limitations, which we do, we can have certain limits that we're looking for for maximum limits. For instance, we don't want to -- you know, the regulations prescribe no more than eight inches in classes one and two, class of track meaning related to a speed operation that the railroads are engaged in. We won't spec to those classes or limitations. And no more than seven inches in classes three through five and they would be the maximum limits. Now, that doesn't mean we're advocating more than six inches of

elevation, it just gives a limitation on what we expect to see in railroads maintaining their track code.

The Vmax formula that you mentioned is a formula that describes the maximum speed limitation based on average of elevation, alignment, and cant deficiency, often referred to as underbalance, and those two terms are interchangeable. So, if someone here speaks of cant deficiency, they're speaking of underbalance. Those terms are interchangeable.

Q. And when we talk about Vmax, the elements of Vmax are how much elevation do I need to put in the high rail, what is the degree of curvature, and it's divided by, like, the magic number. But the square root of that equation is -- tells me the maximum limit for my operating speed given those values of curvature and elevation?

A. The maximum velocity based on the equipment that's running and operating on that piece of track.

Q. Okay. And --

A. Certain equipment can handle different types of cant deficiencies for underbalance.

Q. Talk about that a little bit -- elaborate on that a little bit more just so people understand the design and capabilities of Amtrak equipment versus say regular freight train cars?

A. Well, all equipment in North America can handle at least three inches of underbalance. That's what the limitation is that we set Vmax for as a standard for freight operation. There are

specialized equipment like Amtrak equipment, they can run at a different underbalance. All of Amtrak's equipment -- and I could be corrected here if I'm wrong -- can handle at least four inches of underbalance. There are specialized equipment that runs at higher speeds in high speed track that can handle, I believe, upward of five-and-a-half inches.

UNIDENTIFIED SPEAKER: Seven.

MR. PIRATO: Seven inches of underbalance, okay. So, the higher the underbalance, the higher the speed the train can run on that same geometry.

BY MR. HIPSKIND:

Q. Okay. And take us maybe through some of the terminology that we've been kind of playing around with. When we say super elevation, kind of decode that for the layperson and please continue with your thoughts about three-inch underbalance and four-inch underbalance. Kind of take us through equilibrium and those two underbalance figures?

A. Okay. Well, the term in railroads is usually super elevation. The railroad tracks are elevated above the grade of the -- usually above grade, so the tracks themselves are elevated. So, we call the outer rail elevated above the low rail a super elevation of that structure. So, you'll often see that term written as super elevation. It can often be referred to just as elevation, meaning the outer rails elevated above the low rail.

The term equilibrium that you mentioned is a term where were

looking at the equipment having equal balance on both rails at the same time -- on the low rail and the high rail at the same time. So, all equipment can handle underbalance so -- of up to three inches, so that would be the number that we would -- could elevate above that and run at faster speed.

Q. Okay. And does FRA provide any cautionary language -- or describe for us what you believe happens -- some of the subject matter we're talking about today is we know on the Amtrak corridors on host railroads that they set their Vmax for a maximum authorized speed to maybe accommodate 79 miles an hour. Now, and I don't mean to imply every curve everywhere, but in general, most timetables say 79 mile an hour maximum operating speed for Amtrak trains. You're in agreement with that statement?

A. Well, it depends on the type of equipment if you mentioned four-inch underbalance.

Q. Okay.

A. But it's -- mainly what you're discussing here is a class of track and a class of track for FRA would relate to both freight and passenger speeds. They would be different speeds for freight trains versus passenger speeds. So, you mentioned 79 miles an hour, I'm assuming that you're talking about passenger trains running at 79 miles an hour --

Q. Correct.

A. -- which would be FRA class four, which we give 80 miles an hour as our limitations. So, most railroads will write 79 miles

an hour in there just so they're not going over speed for that particular class of track that they're operating.

Q. Well -- and that -- thank you for that, that explains the safety consideration for keeping Amtrak trains on the track, safe operating speeds and maybe really in truth, some railroads may even have a little bit more elevation as a safety buffer. Does that sound reasonable?

A. I think that would be something for the railroads to answer. But I think each railroad has their own practice.

Q. Okay.

A. It's not a set practice that we set for them for FRA.

Q. And we can certainly discuss that with then. But I think maybe one of the other things that we're ready to introduce into the discussion is we know that on these passenger route corridors. We've talked about freight operations and truth be known, some railroads speed restrict certain types of trains. Well, they might be open-top hoppers or this train or that train, that specific train may be restricted to an upper operating limit. For example, I think in BNSF's timetable, certain trains are differentiated by a hundred-ton braking operation radio -- ratio. But some trains, like inter mobile trains run at faster speeds.

So, with that said and maybe I didn't say it quite clearly enough, I just want to talk about -- a little bit about when we have the degree of curvature, we have the super elevation set for safe passenger train operations. When we run slower trains at

slower speeds, how -- we're no longer in, like, an equilibrium, are we? How would you characterize that? Is that more load bearing on the low rail?

A. You're asking a lot of questions in there.

Q. Well, I apologize for that.

A. So, let's just start with one part of it.

Q. Okay.

A. Inherently built into class of track for FRA. I mentioned class four and we discussed 80 miles an hour is the limitation for FRA for class four for passenger trains. It also has a safety margin built in there for freight trains at 60 miles an hour. So, they are not given the same speed and that's in relationship to the superior suspension systems that obviously passenger trains have over freight trains. So, there is that consideration already built into that class of track conversation.

Operating over 100-ton limits or something like that you measure, that is strictly an operations aspect of the railroad. That has nothing to do -- or bearing on what we're saying about the speed track and curvature operations for engineering standard. That's strictly a decision by railroads for how they want to operate based on certain types of tonnage or whatever they want. Then they -- the consideration may be given to that and restricting those speeds because they're coming over mountain passes and things like that that they don't want to be running too fast at the top and then maybe have a runaway train situation or

whatever that they can't control. So, that is not an aspect of the conversation we started with.

Q. Okay, Mike, I appreciate all of that. So, one final point I want to ask before I hand off is that in everything that we talk about curves, the Vmax, considering the degree of curvature, setting the high rail at the right elevation, for maximum operating speed for passenger trains, and when we're talking about freight trains et cetera. There are other FRA regulations where a railroad has to comply in terms of geometry, profile, and things of that nature, correct? I mean, it's not -- a curve is not just simply the Vmax formula, it's the Vmax formula in conjunction with other elements of the track-safety standards?

A. No, we only look at the Vmax formula and what it is for curve, elevation, and design. Railroads made -- and this is where I got into your initial conversation, railroads themselves have interna protocols that they do maybe for running on passenger trains that I'm not aware of or is not regulatory. Each railroad may operate that differently or have a different consideration on how they want to deal with track that maybe runs most Amtrak trains here since Amtrak's in the room, or, you know, passenger equipment. But that doesn't have any bearing on what we're doing and we're talking about classes accepted through to class five right here in this conversation.

MR. HIPSKIND: Understood. All right, let me pass it on. Thanks, Michael.

Quinn, do you have questions for Michael?

MR. LIGON: No, I do not.

MR. HIPSKIND: Okay, thank you.

And Todd, I'll ask you to come down here. I'll ask you the same thing, do you have questions for Michael?

MR. ANDERSON: No, I don't. Thank you very much.

MR. HIPSKIND: All right, thanks, Todd.

Let's see, in order -- do you want to go, Robert?

MR. NAGEL: Robert Nagel, I have no questions for Michael at this time.

MR. HIPSKIND: Okay, thank you.

And Matt?

MR. HAMMOND: Matt Hammond, no questions.

MR. MORRISON: Roy Morrison, no questions.

MR. HIPSKIND: Troy?

MR. LLOYD: Yeah, my name is Troy Lloyd with the NTSB, L L O Y D.

BY MR. LLOYD:

Q. I do have one question, Mike, I do apologize if you did answer it. Previously you mentioned the term centrifugal force?

A. Yeah.

Q. Could you explain that as a -- to the layperson, maybe then they'll have a basic understanding of what we mean with centrifugal force when it comes to train operations through curves?

A. Okay. Well, it's a way of banking the tracks to counteract some of the speed that the train's going to incur and push towards the outside rail from the center body of the vehicles, right. In order to counteract that, we use a term called elevation or super elevation where we elevate the track -- the out rail -- the outside rail, the longer radiused rail above the short radiused rail or the low rail described. And by banking or sometimes it's described as banking by elevating that curve to a sufficient level, we counteract centrifugal force -- those outside forces.

Q. Just one more question, again, it's Troy.

A. Sure.

Q. You mentioned the term cant deficiency?

A. Yeah, that's synonymous with underbalance.

Q. Understood.

A. They're the same -- they mean the same thing for this conversation.

Q. So, with cant deficiency, could we have trains running at excessive cant whether that be a speed that's --

A. You mean through --

Q. A train moving slow or through a curve that's based with a max of authorized speed.

A. Over elevated?

Q. What would -- can't excess -- excessive can't do for a train -- or a freight train running through a curve?

A. I guess I'm trying to understand what you mean by excessive?

Q. A train running at the speed below the maximum authorize speed. What does --

A. The trains, as they go around the curve, okay, and whatever rail is elevated, okay, the train wheels will want to go to that rail. Even if trains go around a curve that aren't elevated for a quote, unquote optimal for that particular curve, they still are running at an underbalance, they just aren't running as a high of an underbalance or a lateral movement towards the high side. But they're not running at equilibrium even if, you know, it's canted a lot more -- if there's more elevation there than is designed for that. They're still not running solely low side. They'll still move to the high side.

MR. LLOYD: That's all I have, Mike, thank you.

MR. PIRATO: Uh huh.

MR. HIPSKIND: Did we acknowledge -- did I leave out any interviewers? Okay.

BY MR. HIPSKIND:

Q. Michael, let me ask you this question, in everything that we talked about when I asked you earlier about -- we understand about the curves, we understand able the Vmax and having the curves elevated to accommodate a maximum authorized speed. But other elements of the track safety standards have to be plugged in. Let me just cut to the chase, depending on the measurements in the track, a class of track -- or a speed or class of track has to be lowered to meet the existing conditions in the track? That's what

I was trying to spit out.

A. If there's a speed restriction or something like that?

Q. Yeah.

A. Yeah, that's possible.

Q. Or if a certain condition is in a curve that might lower the class of track, that's okay, but we have to keep in mind, there are other track safety standards that apply to the track whether it's tangent or curve?

A. Yes, if you're talking in differences at cross level or something along those lines or alignment thresholds, yes, there are times when other parts of the compliance manual will play and cause speed restrictions.

MR. HIPSKIND: YuJiang, would you come down here and I'll ask you a question? Okay. I think we have completed your first round.

MR. PIRATO: Okay.

MR. HIPSKIND: And I just would ask you now, are there any points of clarification that you want to add? From your perspective, do you have any clarifications you want to make?

MR. PIRATO: That would be up to YuJiang if he wants to clarify something.

MR. HIPSKIND: YuJiang, you listened to the conversations that we had with Michael, did he answer them to your satisfaction?

MR. ZHANG: I would say yes. But if there were some clarification that he can make (indiscernible) or you want me to

clarify --

MR. HIPSKIND: Well, yeah, I think the way I'll respond to that is -- and I've known you for a while and I do know there's a lot more that you have to say. So, let's handle it this way if you're agreeable, we will have the recording transcribed, when we get it, we will pull the same set of questions off in writing and present them to you for a written response. Are you agreeable with that?

MR. ZHANG: Sure, no problem at all. Yeah.

MR. HIPSKIND: And Michael, are you agreeable with that?

MR. PIRATO: Sure, absolutely.

MR. HIPSKIND: Okay. Thank you, guys, very much and if I can get you and Manal to --

Am I pronouncing your name correctly?

MS. BISHR: Yes, sir.

MR. HIPSKIND: I'm sure I've got it butchered up at least a couple times.

MS. BISHR: It's okay.

MR. HIPSKIND: All right, I think for our next round of interviewees, I will talk with Mandal (sic) --

MS. BISHR: Manal.

INTERVIEW OF MANAL BISHR AND ADAM MILLER

BY MR. HIPSKIND:

MR. HIPSKIND: Manal and Adam and let me introduce a little bit of background to set the stage. I've reviewed the timetable

for the Highline Subdivision and discovered the following characteristics and speed limitation listed for train operations. Now, these are the general maximum authorized speeds and in general. I would say that the Highline Subdivision is about 250 miles long give or take a mile or two and under the maximum speed limitations section, the timetable listed three types of train operation, passenger train at 79 mile an hour, trains with under a hundred-ton operating brake ratio at 60 miles per hour. I took that to be intermodal trans. (sic), but you can correct me if you think that idea is wrong. And then the other train category was those over a hundred-ton operating brake ratio, those were -- maximum authorized speed was 55 miles an hour.

And then in addition to that, I did notice there are something like -- this is on the highline, there are something like 36 permanent speed restrictions dotted throughout the length of the subdivision. And I -- you can correct me on that, I just guesstimated probably a lot of those are assigned curve track areas. But you may know more about that. There were several dozen speed restrictions related to entering and exiting siding or end of double-track, beginning of double-track areas. And I guess I would note for our discussion that at the east end of Beulah, all trains are restricted entering and exiting that at 35 mile an hour. So, I know maybe you guys -- your strength isn't to operate, but does that sound about right, the way I've characterized some of the information out of the timetable?

MR. MILLER: Yes.

MS. BISHR: Yes.

MR. HIPSKIND: Yes? Both of you say yes?

MS. BISHR: Yes.

MR. HIPSKIND: Okay. And so, with that as a background, I did not -- I don't want to misrepresent that those who are reading about our conversation that they think that every train operates at maximum speed. There are accommodations, there are restrictions, and I would say probably for safety of the operation of the train. So, I just didn't want people to think that there was just a blanket, trains all operate at 79 miles an hour. So, I think what I've laid out is that there is a mixture of -- kind of a three-speed train operations on the Highline. And so, with that, does that present BNSF in the Operations or Engineering Department with challenges to adjust the track maintenance to meet the operational speed changes that I just described? So, I'm just kind of giving you an open-ended question to -- for you to respond and Manal, do you want to go first or Adam? It's up to you guys.

MS. BISHR: Would you like to go first?

MR. MILLER: Okay. So, what's the questions again?

MR. HIPSKIND: So, the question is how does BNSF meet the challenges? How do you manage? How do you monitor? How do you mitigate any track conditions or whatever so that you're maintaining your operating speeds, but you're doing it in a safe manner for trains operating over the Highline?

MR. MILLER: Okay. So, in general, the Highline, as you define those speed characteristics and differences, we have instructions in different sections of our engineering instructions where our employees use that to help guide them both from a maintenance standpoint. For example, rail limitations, how much rail can wear out before we need to have it replaced. There's guidance on remedial actions for different types of rail defects, track defects, and those kinds of items.

But specifically, as you're looking at the three different speeds between passenger, freight, and the hundred TOB trains, there's three differences there. The hundred TOB and the under hundred TOB are both considered freight trains. So, within our engineering instructions that we have, we design curves for freight trains, and we also design them for passenger trains. We do have a difference between those two as far as an unbalance threshold that's specific to the type of curve and also that type of speed. And we use that with our engineering resources when we are making repairs, building new that will guide us through the Vmax formula and then allow the person who's trying to make that determination understand how much super elevation they need to put in the track based on those parameters with degree of curvature and also speed.

MR. HIPSKIND: Manal, do you want to add anything?

MS. BISHR: No, I don't.

MR. HIPSKIND: Okay. So, help us broaden the understanding

of how does BNSF monitor all the conditions out there? Talk to us a little bit about how you gather data and how you plan for track maintenance or just in general anything along that line?

MR. MILLER: So, BNSF's required to do visual inspections as part of the regulation within part 2.13, so we perform visual inspections. We also have geometry cars that test our entire network. They also collect data on the curves along with track conditions. We have several other technology items that also gather data for understanding, for example, ties. How many ties per mile would we call defective? We begin to set thresholds for when does between mile post, you know, ten and 20 if we have this many ties defective, we're going to plan a tie program to replace those prior to getting into a regulatory defect issue. That's usually done on an annual basis, very detailed for what's going to happen the next year. But we also forecast that out for a range of three to five years just so that we understand where are the next tie projects for running our business and begin to schedule those as we begin to progress.

MR. HIPSKIND: And maybe another way of saying that is as you're monitoring things in relationship to ties, as the defective tie population grows per mile, you may put together a stretch or a segment of track where you initiate a cyclical program maintenance and you come in and you do some out of face work with the track. Do I got that pretty close?

MR. MILLER: That's correct.

MR. HIPSKIND: Manal, any to add there?

MS. BISHR: No, that's all correct.

MR. HIPSKIND: Okay.

You mentioned -- Adam, you mentioned inspections and I kind of get that. I've been around that most of my life. On BNSF, is there any program or policy whereby track inspectors are expected to walk curves, and if so, kind of take us through that? What's the frequency? What's the expectation? What is the reporting?

MR. MILLER: So, internal in the BNSF, within our track inspection section of our engineering instructions, we do require an annual walking inspection of all curves by our track inspectors. The curves are populated within our inspection system. An inspector, when they perform the walking inspection, they record measurements, record the inspection, they're allowed to input freeform text, if they have deficiencies, they can input defects against that. But it's done on an annual basis. There is optional if a local manager wants or so chooses, they can increase that frequency or the inspector can, you know, request I want to look at this curve two times a year instead of once a year. We can make those adjustments within the asset database and then it'll populate for them to record that each year.

MR. HIPSKIND: Okay. Just to be clear, not every territory or every subdivision is a cookie cutter. Some may have a large number of curves, some may have quite a few less number of curves. Do I got that right?

MR. MILLER: That's correct.

MR. HIPSKIND: And when we talk about doing a walking inspection, it is not just one person a track inspector for that territory, that could be substituted by any qualified person under the track safety standards if that person was so designated to perform inspections. Am I right about that?

MR. MILLER: They'd have to be qualified to inspect track and make -- demonstrate knowledge that they can prescribe the appropriate remedial action to track defects.

MR. HIPSKIND: Okay. And another thing I would like, when we were talking with Michael and we got into some terminology about equilibrium, three-inch unbalance, four-inch unbalance, can either one of you address how BNSF looks at that and maybe tell us that application of those terms in your specific freight and passenger operations?

MS. BISHR: Do you want me to take this?

MR. MILLER: Go ahead.

MS. BISHR: So, for BNSF -- sorry, for BNSF, we design our curves freight with a two-inch unbalance and passenger, we design to a three-inch unbalance. And so, if you were to use the Vmax formula, we would look at the current elevation, and then add that unbalance, and that would give us the Vmax, and then we round down to the near five mile an hour to say what that curve is safe for. But when we inspect, we do inspect to the three inch for freight and four inch for passenger, which is what the FRA recommends.

MR. HIPSKIND: Okay. Well, let me slow you down for just second. So, if a degree of curvature -- if I was in a shallow curve, say a one degree, a-degree-and-a half, or two degrees, fairly shallow, it's not a four, or five, six-degree curve, and I do the Vmax formula and it says -- I'm talking for freight operation -- it says well, elevate it to two, two-and-a-half inches. When you use the concept two-inch unbalance, does that two-and-a-half inches of elevation in the high rail then become four-and-a-half?

MS. BISHR: So, yes, is that --

MR. MILLER: Let me give you the Vmax formula so that you can do that.

MS. BISHR: Yeah, so if the unbalance -- yeah, I'm trying to -- this is -- it's counterintuitive.

MR. HIPSKIND: Listen, I'm not trying to confuse you.

MS. BISHR: No, you're not.

MR. HIPSKIND: I just want to simplify it.

MS. BISHR: So, the Vmax is here, so if you take the actual plus that.

MR. MILLER: So, yeah, if you took that and set the elevation to two-and-a-half.

MS. BISHR: So, you're taking it less than that and you're subtracting the unbalance.

MR. MILLER: Subtract the --

MS. BISHR: Okay.

Yeah, so, you're actually subtracting it for the unbalance. So, if you have a -- if you have your curve elevated say the four inches for -- it's going to be more likely four inches and you're allowed for a two-inch unbalance, you would -- you could elevate it to two inches.

MR. HIPSKIND: And have safe operation?

MS. BISHR: Correct.

MR. HIPSKIND: Okay. I just wanted to know which way the elevation and the -- so, do either one of you want to speak to slower freight train operations on curves that are set for maximum passenger train operations of 79? We know that the elevation in the curves to make for a safe passage of passenger train operations is usually more than what is needed for slower train operations. So, just that as a starting point, do you agree with that statement? For passenger trains, we elevate the outer rail higher to accommodate a higher Vmax?

MS. BISHR: Correct.

MR. HIPSKIND: Okay?

MS. BISHR: Yes.

MR. HIPSKIND: But if we did not have passenger train operations, we were not operating trains at 79 mile an hour, and we were back in a pure freight world, many of those curves, the elevation could be lowered and still maintain safe operations? It took me a while to get there, but are you in agreement with that statement?

MS. BISHR: Yes.

MR. HIPSKIND: Okay. All right.

MR. MILLER: I agree with that statement, but it depends.

MR. HIPSKIND: Let's talk about the depends.

MR. MILLER: It depends on the degree of curvature.

MR. HIPSKIND: Okay.

MR. MILLER: You prefaced it with a shallow curve and I'll say that's true. But as you progress with higher degrees of curve, that does change just based on how the formula works for Vmax.

MR. HIPSKIND: Okay. And take me through, how is all of that monitored, the curve characteristics, is it just by running geometry cars nonstop or what's the policy, what's the procedure there in gathering data?

MR. MILLER: So, for gathering data on the curves, we do use our geometry cars for testing. Specifically, within our track geometry part, we have some defects that help us monitor those in a progressive scale with -- you know, we have what we call yellow tags, orange tags, red tags. And so, yellow and orange tags are what we would call advisory defects to our field teams. So, if you begin to get an unbalanced yellow tag defect, for example, that would indicate that our curve is beginning to show signs and symptoms that the elevation needs to be adjusted, and that's how we begin to monitor that through our geometry testing.

This is available to our field employees, so then they do

follow-up inspections on these geometry defects and then make determinations. If a defect does exist, they need to slow the track down or this is beginning to degrade, so we need to program track repairs or maintenance in order to bring it back into compliance with our standards.

MR. HIPSKIND: The yellow and the orange are you're not to a threshold braking value, but heads up for your maintenance planning?

MR. MILLER: Correct.

MR. HIPSKIND: Correct to say that?

MR. MILLER: Yes.

MR. HIPSKIND: Okay. And talk a little bit, what is the goal in a frequency to measure the Highline Subdivision, is it once a month, twice a week, once every quarter? How should we understand that?

MR. MILLER: I'd have to double check. I believe our minimum frequency for geometry testing on that route is a hundred-and-twenty days.

MS. BISHR: I think it's three times a year, so 120 days.

MR. MILLER: Yeah.

MR. HIPSKIND: So, 120 days, three times a year, that's the goal?

MR. MILLER: That's the minimum requirement.

MR. HIPSKIND: Okay. Well, we had a meeting earlier today, why don't you characterize what is going on in the real world?

That Highline -- there's sections of the Highline that get tons more testing, right, and could you explain a little bit why that is so?

MR. MILLER: So, with our geometry system -- or geometry testing system, the Highline Sub (sic) is a route between Chicago and Seattle, which is our east/west route for our northern transcon (sic). Our geometry cars will route out towards the pacific northwest, for example, we have multiple mains there, so we need to meet our minimum requirements for geometry testing out there. It runs in cycles, so then as we look at this portion of the Highline, you will see repeat testing several times because the cars are -- test cars are traversing to and from these multiple main routes. So, for example, on the single-track portion, if we're testing a route out in Seattle on triple track and coming back, our car's going to traverse that Highline Sub more often, especially on single-track railroad because that's the route that it's being tested at.

MR. HIPSKIND: Okay. And in all of that, you're not citing where these single-track sections are. They're not getting over tested, it's just a function of if the car is traveling, it's testing?

MR. MILLER: Correct.

MR. HIPSKIND: Okay. So, you may get more data input?

MR. MILLER: Yep.

MR. HIPSKIND: And the data input that you guys get, you

don’t necessarily -- there’s no requirement to share that with FRA, correct?

MR. MILLER: Correct.

MR. HIPSKIND: Okay. But conversely -- and I forgot to ask Mike this -- we are aware that FRA runs their ATIP car automatic track inspection program, I think. When they run their car, they do provide you, BNSF, with their data from their runs?

MR. MILLER: That’s correct.

MR. HIPSKIND: Yeah, okay. So, let’s switch gears a little bit, I believe that BNSF has a CWR program, continuous welded rail, and that is approved by FRA. So, could you please describe if BNSF sets a goal for rail-joint elimination, in other words, thermit welding? Is there -- describe for us, is there a program x number or hundreds of thermit welds that you -- or joint elimination that you want performed in a year? Help us to understand that a little bit better?

MR. MILLER: It -- so, there’s two things there, a CWR policy, which BNSF does have a CWR policy that was approved by the FRA and that’s part of our regulatory compliance. As far as rail-joint elimination, you know, we create rail joints through service failed rails, rail defects, day-to-day normal track maintenance. Those assets are then characterized within our database, reported to by our field personnel, and then each year we begin to remove those by performing thermit welds, electric flash butt welds, or orgo-thermic welds.

As far as a program, each division across the network is able to see how many joints that they have on their primary corridor that meet those characteristics at CWR. As far as a set goal, that set goal is managed by the individual divisions. There is not a specific number or threshold. I will say, most people are trying to maintain their entire territory with a joint count of less than one point -- one joint per hundred miles or -- excuse me, per mile on the overall average. So, they'll begin to program maintenance windows -- maintenance work through the course of winter, spring, summer, fall, eliminating those trying to get down to what we would call a manageable number, whether it be .2, .5. That's going to vary because the joints are in the track, how many you have -- you know, most people want less because it's less items to maintain. But not all subdivisions are going to get that number because that's just how the line operates.

MR. HIPSKIND: But there's no specific BNSF policy, or is there -- nor is there a FRA regulation that says if you're rail testing -- and generally, a lot of the rail joints appear in the track after rails defect repair. You would agree with that, right?

MR. MILLER: Yes.

MR. HIPSKIND: And so, the point is that there's no mandatory we can't -- you can't leave it in the track forever -- or actually, you can leave it in the track forever. There's no regulatory thing that says oh, you've got to get it out of there.

There's a bolting requirement and then by you running your geometry cars, if you notice or isolate that a particular rail joint is giving you problems, that may prompt you to schedule it for elimination. Is that fair to say that?

MR. MILLER: It's fair to say that.

MR. HIPSKIND: Okay. All right, so what I'm hearing out of all this is you have a regulatory track inspection regiment. People high rail and go over the track, look at the track, and make assessments, right?

MR. MILLER: Correct.

MR. HIPSKIND: And you rely on that boots on the ground, going over the track, close look at it. But in companion with that, it sounds to me like you do an awful lot of geometry car data collecting and those are your true, main sources that you rely upon to monitor, maintain, mitigate challenges that may come up in track degradation?

MR. MILLER: That's correct.

MR. HIPSKIND: So, you're always trying to stay ahead of the game, yes?

MR. MILLER: Yes.

MR. HIPSKIND: Okay. One final thing and then I'll pass it off to some other people here. How should I think -- does BNSF have their set -- their own specific set of track safety standards? Is it -- should I think of it it's the same as what we see in the FRA track safety standards, is it more restrictive,

less restrictive? Could you characterize that for us?

MR. MILLER: There are some parts that it's exactly what the regulations say and then there are also parts where we are more restrictive.

MR. HIPSKIND: Well, could you elaborate, separate that out for us?

MR. MILLER: Okay. So, as we begin to step through our track surface, for example, when we're in our instructions and we're looking at cross level, our cross level thresholds that we call for a defect mirror what the FRA regulation says as far as a defect goes. Within our geometry testing, for example, we have geometry defects that we test for that are not part of regulatory requirements. They're not associated with a regulatory type of defect. So, an example is ADIP 31 defect that we test with the geometry car. It is a short profile or a hump in the track, it may not necessarily fall in line with the same magnitude as profiled. It'll look like a short profile, it won't fall into profile as far as reading it being a defect threshold. But we have set how we measure that defect as a class-specific speed reducing type defect. That's one example of how we have differences that are above and beyond the FRA regulations.

MR. HIPSKIND: More restrictive?

MR. MILLER: More restrictive, correct.

MR. HIPSKIND: Okay. And again, your data collection from running geometry cars keeps you in touch with things before they

get threshold braking?

MR. MILLER: Correct.

MR. HIPSKIND: Okay.

All right, Manal, is there anything you want to add to our discussion thus far?

MS. BISHR: I don't think so.

MR. HIPSKIND: All right. Let me pause here and let's see if the other interviewers have any questions for you.

Quinn, we'll start with you.

MR. LIGON: Quinn Ligon, I have no questions.

MR. HIPSKIND: Todd?

MR. ANDERSON: Todd Anderson, I have no questions at this time.

MR. HIPSKIND: And Robert?

MR. NAGEL: Robert Nagel with Amtrak, no questions at this time.

MR. HIPSKIND: Matt?

MR. HAMMOND: Matt Hammond with BNSF, I do have one question.

BY MR. HAMMOND:

MR. HAMMOND: In order to get there, I want to recover some items with you addressed already, but I don't want to ask you a series of questions. So, what I want to do is I'm going to state some things that I heard earlier and I'd like you to tell me if I'm correct before answering my question. So, class four track has a maximum speed of 60 miles and hour freight, 79 mile an hour

passenger -- 80 mile an hour passenger. Is that correct?

MS. BISHR: Yes.

MR. MILLER: Yes.

MR. HAMMOND: And I'm going to address these to Mr. Miller and then, Manal, I'll as you afterwards if you have anything you want to add on it.

MS. BISHR: Okay.

MR. HAMMOND: Where I was a little confused in your prior testimony is when we were talking about the amount of elevation required for passenger versus freight. So, I'd like you to use your chart and I'd like you to answer a question for me on a theoretical curve design. If we had a curve that was one-minute-and-thirty-five seconds in design, and the maximum freight speed was 60 miles an hour, what would be the required elevation at BNSF standard of two-inch unbalance.

MR. MILLER: Two-and-a-quarter.

MR. HAMMOND: And if that same curve had a maximum speed of 79 mile an hour passenger, what would the elevation be required for BNSF's three-inch unbalance standard?

MR. MILLER: Four-and-a-half.

MR. HAMMOND: So, would it be fair to say that the difference between four-and-a-half and two-and-a-quarter would be added elevation to accommodate a passenger speed in that theoretical example?

MR. MILLER: Correct.

MR. HAMMOND: Thank you.

Manal, is there anything you'd like to add on that?

MS. BISHR: No, there's not.

MR. HAMMOND: I have no further questions.

MR. MORRISON:

MR. MORRISON: Roy Morrison, Brotherhood of Maintenance of Way, I've just got one question. When looking at the Vmax of joint elimination standard, when you do have joints in the track, is there a requirement for the track inspectors to walk and document the original inspection of those joints? And if so, do you guys record them and how often is that, if you could explain that?

MR. MILLER: So, there is a process within our CWR policy. It does depend on some characteristics of type of traffic, billion gross tons. Typically, it's quarterly for a lot of our main routes. The inspector is required, after they perform the inspection, to record that within our electronic database, but also on the rail, write down initials and date that they performed that walking inspection.

MR. MORRISON: Thank you. That's the only question I had.

MR. HIPSKIND: Thank you, Roy.

Who is next? Troy?

MR. LLOYD: Yeah, I do have --

MR. HIPSKIND: Do you want to come around here?

MR. LLOYD: No, I'm good. I'm loud enough, believe me.

MR. HIPSKIND: Okay.

BY MR. LLOYD:

MR. LLOYD: Again, this is Troy Lloyd from the NTSB. Sorry, if it's muffled with the mask and everything. But just a couple documents here just to see if you were aware of them. I just did some research -- just Google search, you know, some tables, some messages out there to see what I get. So, are you aware of -- it is actually Department of Transportation and the FRA, Federal Railroad Administration filed a report that came out in February 2020 that describes cant excess for freight train operations or in shared track? I can let you see it if you want. I don't know if you've ever --

MR. MILLER: I haven't read it.

MS. BISHR: I haven't.

MR. LLOYD: Just to see if it's -- if you're aware of it --

MS. BISHR: I am not aware of it.

MR. LLOYD: Yeah, the -- just to say it's a very good study, it shows running heavy freight trains on curves, accommodating passenger trains such as a host railroad. I'm just saying very good literature. I just wanted to make sure that -- you know, just wanted to see if you all were aware of it. Here's another one that was done by Gary Wolf (ph.), this came in early January of 2006, so it's been out a while. But it's some good literature as well. It's super elevation problems and solutions and also gets into Vmax formulas, again, shared railroads, Amtrak running

on host railroads, freight trains running on Amtrak stuff, how do you deal with that equilibrium stuff, running either, you know, cant excess, overbalance, underbalance, things of that nature. I just wanted to go on the record to show that they're out there or good reading from the group. You know, there's some good literature on there. It gave me a lot to think about, especially with what's going on everywhere throughout the nation. But I do got another question.

MR. LLOYD: I think Roy -- and I'm going to answer -- ask the question while I'm getting the paperwork ready. Were you asking about -- you asked a question about their CWR plan and their curve inspections? Is that what you asked?

MR. MORRISON: No, I asked about the joint inspections.

MR. LLOYD: Okay.

So, BW -- so, BNSF does have an improved FRA CWR plan, correct?

MR. MILLER: Yes.

MR. LLOYD: Okay. So, describe to me how often do the curves -- the CWR curve have to be inspected at a regular basis? I know they're inspected with the -- you know, with the FRA frequency track inspection and all that stuff, you know, however. But is there any kind of CWR inspections that are conducted once, twice, three times a year that's required by the plan?

MR. MILLER: For specifically the curves?

MR. LLOYD: Yeah, just for CWR curves. Is there -- does BWI

(sic) have a CWR curve inspection plan that maybe once a year it has to be walked by foot, things of that nature?

MR. MILLER: So, BNSF does have a walking curve inspection within our engineering instructions.

MR. LLOYD: Okay.

MR. MILLER: Our CWR plan has a curve requirement and it's related to curve staking for minimum degree of curves listed within the policy when -- that we use for curve monitoring.

MR. LLOYD: Okay.

MR. MILLER: But that is the only reference to curves within our CWR plan.

MR. LLOYD: So, bring me up to par. So, as an inspector, what would one do -- if I'm going out to inspect that curve, what would I be looking at and looking for, what would the problems I'd be --

MR. MILLER: A track inspector performing a curve inspection, a routine one, they'd be high railing up to the curve. It does say walking inspection, so that mean they have to park their vehicle. They can park it on the track if they can accommodate it for that type of operation. Depending on length of curve -- if it's a 15-hundred-foot curve, just as an example, they'll begin walking around the curve, looking at the rails, looking at the ties, looking at the fasteners. They're predominantly looking for track geometry type defects, whether it be associated to alignment, gauge, surface. They will be making spot checks for

elevation in the curve, make some notes. They'll then cross reference that both with okay, what's the curve characteristics that either from the geometry car or look at a track chart, see if they're in compliance, and if they are, they're register the curve as inspected, record defects as necessary if they see any, or begin their -- rest of their inspections after it's completed.

MR. LLOYD: Thank you for that. Just one last question, I know you've got -- that Dick was talking about data gathering through the ATIP -- BNSF ATIP car program. It seems that the Highline is inspected more frequently due to the double-main track, going through the single main, into that double coming back, going to that single main again to get the other side of that double. Does BNSF, besides their ATIP car programs, do they use any other type of measuring devices such as let's say vehicle track interact, or locomotives on cars, things of that nature that would give you extra data besides that -- running that geometry car and getting those track inspection reports? Are there any other things like maybe VTI equipment on locomotives or anything like that?

MR. MILLER: Yes, I'll list a few. I don't want to try to leave any off, but there are several technology advances that are out there within the industry. VTI, for example, is vehicle track interaction, those are mounted on specific locomotives with accelerometers. They are measuring a specific kip loading for axel vertical car body movements that are then uploaded and

recorded for additional inspections.

BNSF has a few other items that it uses for monitoring. We do have optical recognition test equipment. Our acronym is THOR for track health optical recognition is the definition. This technology takes pictures of rail joints, looks for broken rails, digital imaging that will capture these different assets when they're tested. We also use ground penetrating radar. This helps drive some different characteristics with our capital maintenance program. Once it's scanned, it helps guide our ballast maintenance and other types of issues.

We also scan ties. Wood ties, for example, we will log and register those for planning our capital tie replacement programs. It's how we begin to find out if we have 800, 600, 12 hundred ties per mile. Whatever the number is, it helps generate and locate those so then we can begin planning out capital maintenance. Those are the ones that I can come up with off of the top of my head here.

MR. LLOYD: Appreciate the interesting -- thank you, Adam. Thank you.

BY MR. HIPSKIND:

MR. HIPSKIND: Thank you, Adam. I'm glad we got into the different areas where you guys are collecting data. I would request -- and you can work with Matt or whoever, how about providing us a full list? If there's more programs for data collecting et cetera, could you take some time and send that to us

in the near future? Is that something -- is that a heavy lift? I'm not sure what I'm asking, but if you mentioned the list and you said that's the only ones I can remember now, we would like a fuller accounting. I guess that's my request. Are you okay with that?

MR. MILLER: I can do that.

MR. HIPSKIND: Okay.

Any -- for the interviewers, are there any other questions to ask of Manal or Adam? Going, going, gone.

Manal and Adam, are there any points of clarification that you would like to make for our discussion? Is there anything else that you want to add, maybe stuff we didn't ask you or anything like that?

MR. MILLER: So, one point of clarification on our geometry test frequencies, our BNSF minimum requirements for our geometry testing is three tests within 12 consecutive months with no less than 60 days between tests. I believe I said 120 days, just wanted to clarify how it's worded within our instructions.

MR. HIPSKIND: Okay, understood.

Manal, anything else?

MS. BISHR: No.

MR. HIPSKIND: Okay. Thank you, both.

And Mike, can I get you, and Adam, and Manal to do the --

Yes, sir?

MR. TROSINO: Can I just make one request?

MR. HIPSKIND: Yes.

MR. TROSINO: Can we take a bio break?

UNIDENTIFIED SPEAKER: No.

MR. HIPSKIND: Yes.

MR. TROSINO: A bio break.

MR. HIPSKIND: Troy, if you'll come over here and clock us off. We are going to accommodate Mike's request, which happens to be a very good one.

MR. TROSINO: Thank you.

MR. HIPSKIND: So, give us a second to get the recorders off.

(Off the record)

(On the record)

MR. LLOYD: Back on the record.

INTERVIEW OF MICHAEL TROSINO

BY MR. HIPSKIND:

Q. All right, Mike, you are our last interviewee and I would say that in our previous discussion, we were basically talking about how a host railroad -- a freight railroad accommodates passenger train traffic. But many people do not realize that Amtrak is a host railroad for freight operations. So, could you begin by characterizing where that occurs and to what degree?

A. Okay. Well, the Northeast Corridor hosts freight pretty much on its entire length at various levels. The bottom level being just local freight, which is pretty much universal throughout the entire Northeast Corridor. There's very few locations where local

freight service isn't provided. There are a couple of places, we'll start in the south and work north. We have municipal train operation between Landover, Maryland and Bowie, Maryland, and then we have heavy haul freight operations with NS between Bayview, Maryland, (indiscernible), Maryland, and Wilmington, Delaware. I know the BNSF people will say this isn't much, but for us, it's around -- between 37 and 40 million gross tons on that segment.

We have through freight service between Wilmington, Delaware, and Philadelphia, and then from Philadelphia to New York is almost exclusively local freight. There's no through freight service in that area. We got through freight service with PNW between New Haven and Providence, Rhode Island, and we have through freight service with CSO and CSX between West Springfield and New Haven, and we have through freight service with CSX and Old Colony between Attleboro, Massachusetts and Mansfield, Massachusetts.

Q. Yeah, and I was a little remiss because when we were talking earlier with BNSF, I probably forgot to talk about that the track safety standards for their railroad and for their operation as a host railroad for Amtrak and they're still running freight, it classes one through five?

A. Right.

Q. Not so with what you just described. Take us through the classes of track we should understand?

A. Well, depending on where you are on the railroad, we have speeds that vary anywhere -- well, between 30 miles an hour and

150 miles an hour that takes us up to up to class eight. The area where we operate the through freight service with A&S is primarily class seven and eight territory. The maximum speed in that zone is 135 miles an hour currently, soon to become 145.

Q. Okay. So, the layperson should understand that when we talk higher classes of track, six, seven, eight, nine, we're at some fairly high operating speeds. And so, the tolerances, the thresholds, the data collecting, take us through that and describe for -- how tight that is and how you manage, monitor, and mitigate all that maintenance?

A. Well, I'll the manage -- the monitoring side of it. When you get to class-six track, it's the first class of track where the FRA mandates the use of track geometry cars. So, we are required under the track safety standards to operate track geometry car under a certain frequency, one frequency for class six, a different frequency for class seven, different frequency for class eight. Each time the frequency goes higher.

So, for example, in class eight track, the FRA mandates that you have to perform a test twice within 60 days with no less than 30 days or something to that effect between tests. So, effectively, it becomes once a month. So, on class eight track, you have to run a track geometry car once a month forever. Class seven track is basically once every two months. Class six track is once a year. So, for our purposes, you know, we operate a track geometry car according to the FRA requirements.

Q. But you also supplement with some other data collection or all the --

A. Well, similarly to what the BNSF does, we have VTI units that we use -- as a matter of fact, the track safety standards mandate the use of VTI units at certain classes of track. So, for example, class seven track requires the use of VTI equipment, class eight track requires the use of VTI equipment and there's different frequencies for both classes of track.

Q. And VTI stands for?

A. Vehicle track interaction, okay. Basically, it's a combination of accelerometers that are mounted on the truck frames and the car bodies of the equipment and they do a continuous monitoring of the truck frame, truck axel box, and car body acceleration.

Q. It sounds to me like what you're describing is real-time, real-world data collection, measurements of the track, the vehicle interface with the track?

A. Pretty much, yes.

Q. Okay. So, take us a little bit deeper. How often is that data looked at, how quickly can a alerts be out there? Take us a little bit into the communication --

A. You're talking about, like, the VTI units?

Q. Yeah.

A. Okay.

Q. Communication and response.

A. Right. Well, the VTI units are basically on all the time and they're mounted on vehicles that then just run randomly over the railroad. So, for example, the Acela fleet, we have 20 train sets. Out of the 20 train sets, 18 of them are equipped. We actually have two train sets that are currently not equipped with VTI units. And whenever those trains run, the VTI units measure and they basically report back to the acellular modem and GPS location. We have a website, you know, a central database, they all report to the central database and whenever an exception is recorded by one of the units, it sends out email messages to a distribution list. So, depending on geofencing, the local track supervisor, the ADE gets the notification and then we also have a duty officer that monitors these units continuously. So, when we get good alerts -- and we have a written procedure, which is required under the CFR that delineates how you handle the exceptions based on what they are and where they are.

Q. Should I think tight response times? Is this -- are these alerts on the order of instantaneous?

A. They are near real time. There's a processing delay that occurs and the requirements for remedial action are delineated in the policy depending on the level of the defect, which can be a slow order gets placed on the track when notification is given or a verification, go out and do an inspection. It depends on the type of defect and the level of defect.

Q. Okay. And when you mentioned the slow orders, are those put

out automatically?
A. No. Every defect is reviewed by a human being first.
Q. Verification?
A. Yep.
Q. But that happens rather quickly?
A. It can depending on the severity of the defect. There's a -- when you look at VTI defects, you can get numerous hits of various levels, so it depends. We have three levels of exception. So, we have what we call a baseline exception, which is a very low acceleration level. It's an indicator of something that's going on. Same thing like the red tag, yellow tag, orange tag that the BNSF have, we have level one, level two, level three, same effect. And so, depending on the level of exception and depending on the location of the exception, it predetermines what we do.
Q. Would -- Mike, would you say that where you are experiencing higher tonnage -- I think you mention 36 or 40 billion gross tons, I would say on a lot of freight railroads, that's some pretty significant tonnage. So, what challenges do you see in those areas where your freight -- I want to get on the record, I believe you're requiring those freight movements probably at night or in decreased --
A. Well, yeah, there's -- well, you have to understand operationally, the Northeast Corridor is a little different than most other railroads. We have what's called an order of particular applicability, which governs how we operate trains on

the Northeast Corridor. It was given to us by the FRA. It dates back to pre-higher classes of track. So, when we were operating its feeds that exceeded class six -- if class six was the top track class, they placed these restrictions on our operation.

So, we're allowed to operate freight trains anytime on the clock face. However, in certain times of the day, freight trains are severely restricted on how fast they can go. So, it kind of creates a compelling operational, you know, issue that we push the freight trains to a certain timeframe -- time window when they can operate at maximum speed for a freight train and also when the least number of passenger trains are operating. So, our freight operating window generally looks to be about 10:00 p.m. to about 5:00 a.m. in most places. But do we have freight trains operating during the day, yes.

Q. But to a lesser degree?

A. But to a lesser degree.

Q. And a lesser number?

A. Correct.

Q. Okay. So, like BNSF, they talked a lot about data collecting, monitoring, and you just talked about the VTI and everything. Is there anything other than that -- are there other programs of data collection that you use to monitor the house of the track?

A. Well, again, similar to the BNSF, we have a track geometry car, obviously. We also have ground penetrating radar; we do the

same analysis for look at ballast condition with ground penetrating radar. We are in the process -- we don't have -- we have a line-scan camera system installed on one of our cars at the moment, but it's a lower-level system used for looking for butt spots. We currently have under construction a line-scan camera that's going to do similar things to what the BNSF had talked about, which is being able to look at the ties, ballast, rail, and so forth. And we also have a joint bar condition monitoring we purchased from Sperry. So, when the Sperry cars do their rail flood detection, we look at joint bar condition as well.

Q. Yeah. And Mike, I could be wrong about this, in terms of ownership, besides the Northeast Corridor, Highspeed Corridor, all that kind of stuff, East Coast type stuff, there is the -- Amtrak owns the Michigan line, too?

A. Well, part of it.

Q. Part of it.

A. Yeah, the Michigan in and of itself is 250 miles of railroad that runs from Porter, Indiana to just outside of Detroit in Dearborn and Amtrak owns the western hundred miles from Porter to Kalamazoo. And then the state of Michigan owns from Kalamazoo to Dearborn, but then contracts that back to us for maintenance and operation.

Q. And a similar thing, freight operations, and you're hosting, and then somebody else has it, the state of Michigan, and they're hosting you going up to Detroit. But an item I want to enter on

the record is those speeds up there are classes one through five?
A. No, we operate class six.
Q. You do?
A. It's 110 mile an hour railroad, yeah.
Q. Okay. And how long has that been going on?
A. On the western hundred miles, we've been operating 110 miles an hour I want to say 15 years. That's a scientific, wild ass guess.
Q. That long?
A. I say that we've been doing a lot of research with -- in conjunction with DOT, funding for PTC.
Q. Yeah.
A. So, the Michigan line has one of the original PTC instillations pre ITMS. It's called ICTS -- whatever -- ITCS and that PTC system allowed us to operate faster than 79 miles an hour on conventional railroad with conventional block signals.
Q. And I think that was one of the first test areas. There was a lot of V&V, verification validation for PTC that was going on up there for years.
A. Correct, yes, for years. It was an unending project.
Q. Okay. All right. Okay, so similar, when we ask BNSF do they have an approved CWR program, tell us about that. You have one?
A. Yes.
Q. And what are some of the elements? We talked to them about joint elimination testing, things like that.

A. Well, I want to predicate this in this way. We've always had a CWR plan, we had an approved CWR plan for years and recently the FRA came back and told us that our CWR plan was no longer valid, and no longer approved, and we had to build a new CWR plan. And after working with the FRA for about a-year-and-half, almost two years, we rewrote the CWR plan so that it more closely aligned with the FRA generic plan, which I believe is almost identical to the BNSF's plan because the FRA kind of mandated that.

Q. Well, I almost hate to ask this, do you think your CWR program was a better program, more restrictive or --

A. It was different. I'm not going to say it was more restrictive, or better, or worse. I think some of the aspects of the current plan that we have that's approved are better than what we had before and some of the requirements that we're supposed to do actually make us a little bit better railroad for, you know, taking care of things. But it's a value judgement, you know, it's apples and cumquats a little bit. Do they all cover the same basic elements, yes. Do they do it in a slightly different way, yes. But it is what it is and we have that CWR plan in place today.

Q. Okay. What -- fill our heads with how do you guys set goals, policy, approach the business of joint elimination?

A. Well, if you look at it as a policy perspective or desire, your desire is to eliminate all joints. It's a worthy goal, but it's almost an impossible goal to obtain because for every joint

that you eliminate, you're almost creating another one. You're constantly doing rail flood detection, you're constantly finding service failures, you're constantly having issues with pieces of rail that have to be replaced. So, depending on the circumstances of rail replacement, sometimes you can weld the rail in when you replace it, sometimes you can't. Most times you can't, you know, we have a time imperative that doesn't necessarily allow a rail replacement to be replaced with welded joints. So, you cut a piece of rail out, you replace it with two rail joints. You hopefully have the opportunity to come back at a later date and eliminate those joints, but you don't always have that opportunity in a timely fashion.

Q. Somewhere I hear somebody say that you guys had a pretty high goal of trying -- when you introduce a rail joint, say the high rail test -- rail defect testing, that a goal -- not a requirement, but a goal was to try and get it welded up, like, in a matter of days or hours. Is there any truth to that?

A. I'm not going to say one way or the other how truthful that is. In my experience in this aspect of the job, that is not a goal that has been stated, okay. It is certainly something that I would love to have happen, but it's not necessarily something that's required, okay. We have in our CWR plan requirements for what to do with rail joints. The intention is that if we introduce joints in the track, to come back and eliminate those joints at some point in the future and hopefully before 60 days,

which is what our CWR plan says.

But if you can't eliminate the joints within 60 days, we have in the CWR plan a methodology for hardening the joint location. So, in other words, we require anchoring ever tie or -- which in our case is not too difficult because most of our track is elastic fasteners and putting in a six-hole bar rather than a four hole and so forth. But eliminating a joint as a requirement is not in the plan.

Q. Okay. But like BNSF, are you mindful if your joint -- rail joint population is increasing, decreasing, and is there enough money put toward keeping your joint population in control?

A. Well, one of the things that, you know, you have to keep in mind is there's really two budgets -- actually, three budgets when it comes to performing track maintenance in general. There's the money budget that says do I have enough money to do this? But sometimes, money isn't the object, money isn't the problem. The resources are the problem. I don't have the track time; I don't have the personnel, okay. I can't do all of this all at once because I don't have the people to do it all at once.

Q. Choices?

A. Right. So, you have to do triage on it.

Q. Okay. So, I'm intrigued at the speed of the train operations for your Amtrak trains, passenger trains. I imagine some of the thresholds are just about as tight as tight can be and my question is are you aware of any testing beyond lookout for certain values

to appear in the track because we can get some harmonic rock or we can get some adverse reaction? Talk us --

A. Well, that's the VTI system.

Q. Okay.

A. Okay, because it is a setup where you're not measuring track geometry, you're measuring the vehicle's reaction to track geometry, okay, and that is vehicle specific, and it's track geometry specific, and it's also speed specific, okay. So, you can have an anomaly in the track that a vehicle doesn't like and if your vehicle happens to have a VTI unit on it, it's going to ring the bell and say I have a defect here in terms of VTI units. In the track safety standards for classes six, seven, eight, and nine, those limits are spelled out in the CFR.

Q. And are you aware of any kind of distance or time measurement in hertz or whatever where you experienced --

A. Well, if you're talking about vehicle track interaction, right, and what the VTI systems are looking at, they're looking at the reaction of the vehicle to a track probation, whatever it is. And the vehicles that operate depending on what vehicle it is, all have their own natural frequency and -- on the suspension and that natural frequency is going to result in vehicle harmonics that are good or bad depending on how the geometry lines up with the vehicle's natural frequency. And if you have a combination of geometric shapes that are in tune with the vehicle's natural frequency, the vehicle's going to react badly to it.

Q. So, bad spot in the track action, equipment reaction?
A. Correct.
Q. Have you got any study on some of the distances or figures of how quick that can happen?
A. Again, yes, there are numerous papers on it. I can't spell out which ones, I couldn't give you a title, but I know I've seen numerous investigations into that. But yeah, it depends on the vehicle. It depends on the geometry of the vehicle, it depends on the suspension type of the vehicle, it depends on the inertial masses, where they are, and how they're located, and the vehicle will react to track geometry in a way that may or may not correspond to the track safety standards, which is why the VTI systems are, you know, useful in that respect because it's like a rough ride. You get a rough ride on a car; it doesn't necessarily mean there's a track defect.
Q. In general terms, Amtrak has a locomotive fleet. I imagine an awful lot of it is dedicated to the Northeast Corridor, the Highspeed Corridor, things of that -- things that are on your property. But your other fleet that is used to transport trains on the broader host railroad, rail passenger network, are those locomotive -- are they VTI equipped or -- help me understand that?
A. Well, you have to understand, for the purposes of our operation, we obviously concentrate our resources and efforts on the Northeast Corridor because we have to do the maintenance there, okay. Do we have vehicles that wander off the Northeast

Corridor that would have VTI units on them, yes. We have probably less than a dozen that operate on a national network that would have a VTI unit on them. But the vast majority, of course, is concentrated in the NAC.

Q. But for the general style of locomotive that is out in the broader host railroad, rail passenger network --

A. We don't have any that are installed on the diesel locomotive fleet, no.

Q. Is there a feasibility to do that if you wanted to do that?

A. I don't know what you mean by feasibility. Is it possible to do that, yeah.

Q. I mean, the design of the locomotive would accommodate attachment of VTI?

A. Oh, yeah, any -- the units are, you know, tailored to fit on equipment. So, whether it's a P42 locomotive, an ACS64 locomotive, or a superliner, or an air fleet car, you can install a unit on the car. It's whether you feel you need to or not. For us, since this Track department -- Engineering Department driven system, I'm interested in maintaining my railroad, so I'm going to concentrate my resources to monitoring the railroad that I have to be responsible for.

Q. So, what we've been talking about is if additional measuring equipment, VTI type systems were attached to the locomotive fleet, is this an expensive proposition or what are we talking about here, just a ballpark?

A. Yeah, it's a pretty expensive proposition if we had to let's say equip our entire fleet. That's a lot of money. Units are -- well, they're less than a hundred thousand dollars apiece, but when you're talking about -- you know, we have 200 and some diesel locomotives and 13 hundred passenger cars. If we were to equip the entire fleet, that's a lot of money. And then it also becomes a data handling issue because now I've got all these units reporting all the time, you're just going to overwhelm yourself with information that maybe you can or cannot parse.

Q. Well, there would have to be support to accommodate that?

A. That's correct.

Q. There'd have to be a human infrastructure, computer analyzed infrastructure. And then maybe another aspect of this hypothetical is well, once you get the data, then you have to interface with people out there in the real world who are not part of your system?

A. That's correct.

Q. And that could introduce a degree of complication?

A. That would be a large degree of complication, I'm sure.

MR. HIPSKIND: Okay. All right, I think that's all I've got for right now. Let's see if any of the other interviewers have any questions.

MR. TROSINO: Sure.

MR. HIPSKIND: So, as in the past, Quinn, any questions for Mike?

MR. LIGON: I have no questions.
MR. HIPSKIND: And Todd, please?
MR. ANDERSON: I have no questions at this time.
MR. HIPSKIND: All right. Thank you, Quinn, Todd.
MR. NAGEL: Robert Nagel with Amtrak, no questions at this time.
MR. HIPSKIND: Matt?
MR. HAMMOND: Matt Hammond, no questions.
MR. MORRISON: Roy Morrison, no questions.
MR. LLOYD: Troy Lloyd, no questions.
MR. HIPSKIND: You must have done a really good job.
MR. TROSINO: Well, you didn't do so bad.
MR. HIPSKIND: So -- well, independently, all of you interviewees did a great job and I think we've got the conversation about. But let me indifference to if we didn't ask the right questions.
BY MR. HIPSKIND:
Q. Mike, is there anything else on your mind? You kind of know the topic here that we're talking about, it's more geared to not your experience on the Northeast Corridor, but just passenger train operations on the freight railroad and maybe some of the challenges that slower speed freight operations have in that infrastructure. Do you experience any of that for your property?
A. I would say that it's approximately the same, you know, building and maintaining track is building and maintaining track.

We are lucky in the Northeast Corridor in a sense, and I say it this way -- and I don't mean lucky per se, but when you're maintaining track to class seven and eight standards, as you said before, it's tight tolerances. So, when you have good track, good track is good track and if we're already in a place where our variations in geometry are so small, freight trains don't really see it, you know, at the speeds they run because right now, maximum speed for a freight train on the Northeast Corridor is 50 miles an hour. (Verbatim) That's predicated on the ability of the train to brake and not on the quality of the track that it has to run on. So, we don't see a lot of deteriorating effect freight operations only because we're not -- we already have the track that's well beyond what the freight train requires.

Q. All right. Anything else you want to add to the conversation?

A. No, that's pretty much done.

MR. HIPSKIND: Okay. Let me do the closeout piece with you. Let me start and I think we'll get through this pretty good. It's always the last piece of paper you grab.

MR. TROSINO: Good thing.

BY MR. HIPSKIND:

Q. Is there anything -- Mike, is there anything that you would like to add or change? Do you think we got your views on all this?

A. No, I'm pretty set.

Q. Okay. Are there any questions we should've asked by did not?
A. I'm not going to -- no.
Q. Were we too far a field -- we didn't cover what you thought we'd cover or have we covered what we kind of indicated we would cover?
A. No, I think I'm good.
Q. Okay. Do you have any suggestions for preventing a reoccurrence -- and maybe I would change that, what is the lesson learned in how you guys manage, monitor, and mitigate track conditions on the Northeast Corridor? What's the takeaway that you would tell us helps prevent accidents on your property?
A. That's an interesting question. It's just diligence. It's just maintaining inspections, paying attention to what you do, and following the engineering practices. It's pretty simple as that.
Q. And you're collecting data nonstop?
A. Well, the data is an aide to doing the work. But doing the work is doing the work.
Q. So that you don't collect bad data?
A. Right.
Q. Okay. Point well taken. And I think I know the answer to this, is there anyone else who we should interview at Amtrak?
A. I would say no.
Q. I would say you're the subject matter expert is what I would say.
A. Okay.

MR. HIPSKIND: All right. Thank you, Michael, for your patience and for the time that you spent coming out here. I just wanted to tell you, I thought you added a tremendous about of value.

MR. TROSINO: Oh, thank you.

MR. HIPSKIND: So, we greatly appreciate you being out here.

And so, well, let’s continue with our folks from BNSF and I will -- if you guys want to switch your chairs, we’ll do the dance here.

BY MR. HIPSKIND:

MR. HIPSKIND: And basically, I will start with you, Adam, and Manal, the same questions for both of you. You can answer them in whatever order you want to do. So, Adam and then Manal, is there anything you would like to add or change in our conversation about host railroads, freight operations, all that kind of subject matter?

MR. MILLER: No.

MR. HIPSKIND: You're sure?

MR. MILLER: Yep.

MR. HIPSKIND: I’m sure you're sure.

Manal?

MS. BISHR: No, there’s nothing I’d like to add.

MR. HIPSKIND: Okay. Are there any questions that we should’ve asked but did not?

MR. MILLER: Nope.

MS. BISHR: No.

MR. HIPSKIND: Okay. And do you have any suggestions for preventing a reoccurrence and maybe a better way to ask that is -- I was remiss, neither one of you were out and a part of the accident investigation? You were not on scene, you're here to talk about the subject manager of hot railroads and freight operations, et cetera. So, maybe the better thing is do you have a view on how you keep doing what you're doing or improve what you're doing?

MR. MILLER: Keep with the standards, keep collecting data, analyze that data, draw conclusions that can help improve the infrastructure and the standards we have.

MR. HIPSKIND: Stay ahead of the curve. No pun intended.

Manal?

MS. BISHR: No, I agree with Adam, we have a lot of data and we need to make sure we’re using it.

MR. HIPSKIND: Okay. And is there anyone else who we should interview?

MR. MILLER: Not that I can think of.

MR. HIPSKIND: Okay.

MS. BISHR: No one I can think of.

MR. HIPSKIND: Again, same as Mike, thank you, both, for your time coming out here and thank you for adding value to the investigation.

MR. HIPSKIND: And Michael?

MR. PIRATO: I can speak loud enough from here.

MR. HIPSKIND: Okay. Yell and speak loudly enough, that's fine.

MR. PIRATO: Yes, sir.

BY MR. HIPSKIND:

Q. Same questions -- I'll ask you the same thing. Is there anything that you would like to add or change with the value that you added to our conversation today?

A. No. I hope I added value, but no.

Q. Well, I assure you, you did and I'm looking forward to YuJiang's written responses and he'll --

A. That would be my response to the next question.

Q. Okay. Well, let me get to it. Are there any questions we should've asked you but did not?

A. No.

Q. Okay. And do you have any suggestions for preventing a recurrence?

A. Not at this time.

Q. Okay. Is there anyone else who we should interview?

A. Sure. Well, you'll get written responses for my surrogate.

MR. HIPSKIND: Okay.

And YuJiang, you're good with all of this?

MR. ZHANG: I'm fine, thank you.

MR. HIPSKIND: Okay. All right, and I was remiss, I got off my game here a little bit.

John, as the representative for Michael, was there any clarification that you wanted to add to anything that we discussed with him?

MR. BONVENTRE: No clarification, thank you.

MR. HIPSKIND: All right. Thank you, John, for being here.

I would say to the group I very much appreciate your time and your questions.

And Troy, if I can get you -- any final comment from you, Troy?

MR. LLOYD: No. I appreciate everybody coming, I know it was quick response from everybody to get here. Matt, Ryann, thanks for getting that panel here. I know it was a real quick thing can we do it. We had the holidays coming up, but you made it happen an di appreciate it very much.

MR. HAMMOND: Ryan didn’t have anything to do with it.

MR. HIPSKIND: All right, before we get too loose and overload the transcriptionist, thank you everybody and with that, we will adjourn. Again, thanks everybody.

(Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF:	FATAL AMTRAK DERAILMENT NEAR JOPLIN, MONTANA ON SEPTEMBER 25, 2021 Interview of Michael Pirato, Manal Bishr, Adam Miller, and Michael Trosino
ACCIDENT NO.:	RRD21MR017
PLACE:	Beach Grove, Indiana
DATE:	November 17, 2021

was held according to the record, and that this is the original, complete, true and accurate transcript which has been transcribed to the best of my skill and ability.

Carolyn Hanna
Transcriber