UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

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Investigation of: *

UNION PACIFIC RAILROAD TRAIN DERAILMENT, HAZARDOUS MATERIAL RELEASE, AND FIRE IN TEMPE, ARIZONA, ON JULY 29, 2020 * Accident No.: RRD20LR005

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Interview of: STEPHEN CHENEY, Senior Director of Design and Environmental
Union Pacific Railroad

TOMASZ GAWRONSKI, Director of Bridge Inspection
Union Pacific Railroad

Via videoconference

Wednesday,
March 31, 2021

I, STEVE KRAUSE, have read the foregoing pages of a copy of my testimony given during a follow-up interview stemming from NTSB's investigation of the derailment of Union Pacific Railroad Company's Train MTUPX-29 with a bridge strike and fire on July 29, 2020 in Tempe, Arizona and these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

Date: 4-19-2021 Witness: [redacted]

I, Stephen Cheney, have read the foregoing pages of a copy of my testimony given during a follow-up interview stemming from NTSB's investigation of the derailment of Union Pacific Railroad Company's Train MTUPX-29 with a bridge strike and fire on July 29, 2020 in Tempe, Arizona and these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
9	4	"from 2013 to 2015", word missing
9	6	"to 2018" instead of "(audio skip)", word missing
9	7	remove "(audio skip)", no words missing
32	3	remove "We have to"
32	5	remove "--"
34	21	remove "those are --"
37	20	remove "so at --"
57	2	remove "(sic)"

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

Date: 4/23/2021 Witness: [redacted]

I, Tomasz Gawronski, have read the foregoing pages of a copy of my testimony given during a follow-up interview stemming from NTSB's investigation of the derailment of Union Pacific Railroad Company's Train MTUPX-29 with a bridge strike and fire on July 29, 2020 in Tempe, Arizona and these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
15	20	"considered part" instead of (audio drop) – clarification
15	25	"a" instead of "as" – spelling
16	13	"types of spans," instead of "types," – missing word
19	20	"regulations from" (indiscernible) (audio drop) – missing words
21	17	"accurate" instead of "--"– missing word
24	15	"present" instead of "(audio skip)" – missing word
25	5	"guardrail," instead of "--"– missing word
25	6	"track" instead of "--"– missing word
36	1	"opposite" instead of "--"– missing word
36	5	"Low Mile post is" instead of "--"– missing word
38	23	"the rating" instead of "--"– missing word
39	25	"superintendent of" instead of "--"– missing word
40	19	"records" instead of "--"– missing word
42	22	"number of collapses" instead of "-- it"– missing word
43	25	"three did" instead of "--"– missing word
46	22	"install a new" instead of "audio drop"– missing word
48	4	"BMP" instead of "--"– missing word
48	15	"That" instead of "You"– wrong word
49	14	"trucks on " instead of "tracks"– pronunciation missing word
50	25	"would have to" instead of "(indiscernible)"– missing words
67	14	"defects" instead of "--"– missing word
67	19	"vetted" instead of "--"– missing word
68	20	"adjustments" instead of "adjustment"– correction
74	6	"around" instead of "about"– correction
80	9	""capacity" instead of "(indiscernible)"– missing word
80	18	"replacements" instead of "(indiscernible) ones"– Correction

81	14	"changes" instead of "--"– missing word
85	14	"a note of" instead of "some"– correction
96	13	"calls" instead of "call"– correction

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

Date:___4/21/2021__________ Witness:___[redacted]

APPEARANCES:

RICHARD HIPSKIND, Investigator in Charge
National Transportation Safety Board

DAVID RAYBURN, Bridge Group Chairman
National Transportation Safety Board

GEOFFREY McCORMICK, Manager/Supervisor of Railroad Safety Program, Hazardous Materials Inspector
Arizona Corporation Commission

JOHN ALLBERRY, Director of Safety
Union Pacific Railroad, Southern Region

JASON TAULLIE, Director of Operating Practices and Rules
Union Pacific Railroad

RYAN BITTNER, Manager I of Technical and Systems Integration
Union Pacific Railroad

RYAN FRIGO, Operations and System Safety Investigator
National Transportation Safety Board

STEVE KRAUSE, Civil Engineer Structural
Federal Railroad Administration

I N D E X

I N T E R V I E W

MR. HIPSKIND: Good morning, everybody. My name is Richard Hipskind, and I am the investigator in charge and both the operations and track and engineering group chairman for NTSB for this accident. We are conducting this panel interview with two Union Pacific bridge and structures directors virtually today on March 30th -- 31st, excuse me, 2021.

This interview is part of NTSB's efforts in conducting a series of follow-up interviews to understand the bridge inspection and bridge design process and oversight of Union Pacific's bridge and structures procedures for the Tempe Town Lake bridge after the derailment event on both June 26th, 2020, and again on July 29th, 2020, at Milepost 913.91 on Union Pacific's Phoenix Subdivision in Tempe, Arizona, in Maricopa County. The NTSB accident reference number is RRD20LR005.

I want to read just a little bit of some mandatory language before we get to the introductions. The purpose of the investigation is to increase safety, not to assign fault or blame or liability. I tell people, this is not about -- our goal today, our effort today is not about finding right or wrong; it's potentially about finding something better.

NTSB cannot offer any guarantee of confidentiality or immunity from legal or certificate actions; generally, that applies to aviation. A transcript or summary of the interview will go into the public docket; I'm sure you're all aware of that.

And I have told both the interviewees about having a representative, and we'll hear from them shortly.

So, before we begin our interview and questions, let's go around the table virtually and introduce ourselves. Please state and spell your last name -- your full name and then spell your last name. Please identify who you are representing and your title and where you're located as well.

I would remind everybody to speak clearly so we can get an accurate recording and also a reminder that we will -- we typically use acronyms when we speak, but others will not necessarily know what we're referring to, so please take a moment or two and let us know what the acronyms stand for.

I'll lead off and then pass of in the order that we agreed upon for the process. Again, my name is Richard Hipskind. The spelling of my last name is H-i-p-s-k-i-n-d, and I am the investigator in charge and the operations and track and engineering group chairman for NTSB on this accident.

And, David, if you'll introduce yourself, and then Geoffrey.

MR. RAYBURN: Yes, my name's David Rayburn. I'm the highway bridge group chairman -- just the bridge group chairman. I work for the National Transportation Safety Board. I've been working for the Safety Board for about 42 years, and I live here in Houston, Texas.

MR. HIPSKIND: And Geoffrey?

MR. McCORMICK: Good morning. Geoffrey McCormick. I'll go ahead and spell both since my first name is a little unusual. It's Geoffrey, G-e-o-f-f-r-e-y, last name McCormick, M-c-C-o-r-m-i-c-k. I'm representing the Arizona Corporation Commission, which will be abbreviated as ACC. My role with the Commission is the supervisor and manager of our railroad safety program as well as being our primary hazardous materials inspector. Good morning.

MR. HIPSKIND: And, John, if you'll introduce yourself and your team, Jason, and then Ryan.

MR. ALLBERRY: John Allberry, A-l-l-b-e-r-r-y. I'm the director of safety for the southern region for Union Pacific Railroad; 33 years with UP.

MR. HIPSKIND: And, John, you're located in?

MR. ALLBERRY: Houston.

MR. HIPSKIND: Okay.

MR. ALLBERRY: Spring, Texas, actually.

MR. HIPSKIND: Okay.

Jason?

MR. TAULLIE: Good morning, I'm Jason Taullie, T-a-u-l-l-i-e, with Union Pacific Railroad. I'm headquartered in Omaha, Nebraska.

MR. HIPSKIND: And your title, Jason?

MR. TAULLIE: Oh, apologize, director of operating practices and rules.

MR. HIPSKIND: Okay.

And then the other Ryan?

MR. BITTNER: Good morning. Ryan Bittner, last name is B-i-t-t-n-e-r. I'm out in Omaha, Nebraska. I'm Manager I of technical and systems integration.

MR. HIPSKIND: Okay. Thank you, Ryan.

And then the real Ryan and then Steve Krause, please.

MR. FRIGO: Hi, good morning. Ryan Frigo, F-r-i-g-o. I'm an operations and system safety investigator with the NTSB.

MR. HIPSKIND: Thanks, Ryan.

And Steve, Steve Krause?

MR. KRAUSE: Steve Krause, last name K-r-a-u-s-e. I'm a civil engineer structural with the Federal Railroad Administration and I am in Denver, North Carolina.

MR. HIPSKIND: A good place to be.

Okay, thank you, all. And now we'd like for the interviewees to introduce themselves onto the record, so Steve Cheney and then Tomasz.

MR. CHENEY: Very good. My name is Steve Cheney. My full name is Stephen, S-t-e-p-h-e-n, and Cheney is C-h-e-n-e-y. I'm representing Union Pacific Railroad. I've worked for Union Pacific for 23 years. My role is the senior director of design and environmental within the engineering department, and I'm located in Omaha, Nebraska.

MR. HIPSKIND: Thank you, Steve.

Tomasz?

MR. GAWRONSKI: My name is Tomasz Gawronski, spelled

T-o-m-a-s-z, last name G-a-w-r-o-n-s-k-i. I work for Union Pacific Railroad for last 23 years. My title is director of bridge inspections, and I'm located in Omaha, Nebraska.

MR. HIPSKIND: All right, thank you, gentlemen. Just a few quick questions. Gentlemen, do we have your permission to record our discussion, our interview with you today?

MR. CHENEY: Yes.

MR. GAWRONSKI: Yes on my end.

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

MR. CHENEY: No.

MR. GAWRONSKI: No.

MR. HIPSKIND: Thank you. And you guys know me. Do you have a problem if we just continue our discussion today on a first name basis?

MR. CHENEY: That'd be fine.

MR. GAWRONSKI: No concerns on my end.

MR. HIPSKIND: All right, thank you.

INTERVIEW OF STEPHEN CHENEY AND TOMASZ GAWRONSKI

MR. HIPSKIND: So let's proceed, and if each of you would please give us kind of a synopsis of your work history, and take us up to your present assignment or position, and let us know how long you have been in that position. And as part of your answer, if you could just kind of paint the picture, what are your duties and responsibilities? And, Steve, if you don't mind, could you go first?

MR. CHENEY: Yes. I started with Union Pacific Railroad in 1997, and I worked in the structures design group as a designer and then a manager until 2013. In (audio skip) to 2015, I served as the director of engineering environmental services. From 2015 (audio skip) I served as the general director of environment (audio skip). And from 2018 to the present, my role has been the senior director of design and environmental.

MR. HIPSKIND: Steve, let me interrupt here for a minute. I'm going to poll the rest -- are you hearing some of Steve's audio chopped up?

UNIDENTIFIED SPEAKER: I did a little bit.

MR. McCORMICK: Choppy here in Arizona.

MR. HIPSKIND: Okay. Steve, can you look into that -- are you hearing us okay, Steve?

MR. CHENEY: I am.

MR. HIPSKIND: Okay. I don't know what's going on on your end, but a couple of your answers came in a little chopped up. But we'll see if it persists, and if it does, we'll just kind of stop and see what we need to do to correct that. It's all part of our virtual world that we have to deal with these days.

Steve, did you complete your answer?

MR. CHENEY: I did. If you need me to repeat any parts of that, I can certainly do so.

MR. HIPSKIND: Let's kind of keep going and just put a note that, when I send you out an errata sheet, if there -- if you see some places where it's indiscernible, you might want to fill it in, okay?

MR. CHENEY: Okay.

MR. HIPSKIND: All right.

And, Tomasz, I'll hand it over to you then. Same questions.

MR. GAWRONSKI: Okay. My work, history, I started working for Union Pacific in the design department as senior designer in 1997. I stayed in design department for approximately 4 years. 2001, I started working as manager bridge maintenance in Des Moines, Iowa. In 2006, I started working as a director bridge maintenance on the southern region in Houston, Texas. In 2014, I took over as director bridge construction for 4 years, still remained in Houston, Texas. And in 2018, I took over the position -- my current position as director bridge inspection and moved to Omaha, Nebraska.

MR. HIPSKIND: Okay. Thank you, Tomasz.

And before we begin our conversation and discussion today, let me say that we want to cover the following: some definitions about bridges and bridge design, the application and purpose of inner guard rails, load path redundancy in general, as well as a better understanding of how risk analysis is included in bridge design and new construction.

But before we begin, let's establish some common agreement on some terms, and I do want to introduce for the record, I think, between David and I, we're going to -- commonly, we're going to be referring to inner guard rail; we may use the acronym IGR. And we're going to be talking about load path redundancy, and we may use the acronym LPR.

But -- and in full disclosure for this interview, NTSB chose to provide UP with a list of research items and questions to facilitate our discussion today so that the numbers would be as accurate as possible rather than to ask questions and receive answers to the effect that we'll have to get back to you on that. So hopefully a lot of the work that we've done in preparation for our interview will keep the flow going pretty good.

So, gentlemen, UP provided us some numbers about their bridge population, as well as a breakdown of the numbers of spans categorized by construction type with a designation of load path redundant and not load path redundant. And I know David's going to talk a lot about that, but I just wanted to get some fundamentals nailed down.

So if, Steve or Tomasz, either one of you can answer this: when we use the term "bridge," what defines that a bridge is counted? Is it a matter of height, length? Either one of you want to tackle that?

MR. GAWRONSKI: So maybe I will start first, on the inspection side, what we identify as bridge. It would be a structure that would be spanning between one embankment to the other embankment.

MR. HIPSKIND: Okay.

And, Steve, are you in agreement with that as a definition?

MR. CHENEY: Yes.

MR. HIPSKIND: Okay. And just so we parse out that bridges, when we talk about embankment to embankment, that's everything at that location, but I think I'm correct in this, and you guys correct me if I'm wrong: when we talk about a bridge location, we could be talking about multiple, multiple spans and multiple types of bridge construction.

So just to elaborate on that, Tomasz, could you describe the Tempe Town Lake bridge prior to the July 29th incident? In other words, tell us about all the components and the complexity of when somebody says, well, the Tempe Town Lake bridge; well, there's a lot that makes up that, and if you'll address that.

And then, Steve, once he's done, if you could describe that same Tempe Town Lake bridge but maybe it has some new construction aspects to it.

So, Tomasz, if you'll lead off.

MR. GAWRONSKI: Okay. So prior to the derailment, the recent derailment, the Tempe bridge was composed of five segments. We call them as letter designation A through E. Each segment had various number of spans; Segment A had two spans, Segment B had one span, Segment C had seven spans, Segment D had one span, and Segment E had 15 spans.

MR. HIPSKIND: And can you elaborate a little bit more on the different type of construction of each of those segments, Tomasz?

MR. GAWRONSKI: Yes. The Segment A was -- would be designated as a precast concrete box girder. It was built in 1990, so portion of the bridge was replaced with one segment. Segment B was constructed in 1912 and had single span; it was a through truss riveted open deck. Segment C had seven spans of the designation of through truss pin-connected open deck. Segment D was one span which was through truss riveted open deck. And Segment E was TST -- as timber stringer trestle -- 15 spans.

MR. HIPSKIND: And the last segment that you described, if we were out in the field and taking a look at a cross-section of that, what we would see is concrete construction that was supported by wooden trestle bents, right?

MR. GAWRONSKI: The last segment would be complete -- which was Segment E, it was all timber: had timber piles, timber caps, timber stringers, and timber deck. That was holding the entire track structure, that is track, rails -- or ties, rails, and ballast.

MR. HIPSKIND: Okay. And Segment E, that had a ballast -- it was supporting ballast -- a track setting in ballast, correct?

MR. GAWRONSKI: That is correct.

MR. HIPSKIND: Okay. And I also want to identify that Segment E, for purposes of this investigation, it's the south approach going into the through trestle, right?

MR. GAWRONSKI: That would be the geographic south approach, correct.

MR. HIPSKIND: Okay. And I know that's different than timetable.

So, Steve, do you agree with that description, and how should we think of the Tempe Town Lake bridge now?

MR. CHENEY: Yes, I do. We should think of it now as Segment D is composed of five pre-stressed concrete box girder spans, Segment E is composed of one 133-foot through plate girder steel span, and Segment F is composed of six pre-stressed concrete girder spans.

MR. HIPSKIND: And then -- and the rest of the through truss is as Tomasz described?

MR. CHENEY: That's correct.

MR. HIPSKIND: Okay. And I think you gentlemen worked up some other general bridge bullets that kind of paint the portrait of UP's bridge population, so I'll just ask you, in general, what do we think the number of bridges, not -- we're not talking anymore about individual spans, but bridge locations. If you could give me a number associated with that.

And then, I think, too, you have kind of condensed how many miles or how many feet of bridge, and Tomasz, can you address that?

MR. GAWRONSKI: Yes. We have 16,670 bridges across the system, we have 73,000 spans, and we have approximately 418 miles of bridges.

MR. HIPSKIND: Again, how many miles was that, Tomasz?

MR. GAWRONSKI: Four hundred and eighteen.

MR. HIPSKIND: Okay.

Steve, you're in agreement with all that?

MR. CHENEY: Correct.

MR. HIPSKIND: All right. Next, I want to turn my attention to the application of inner guard rails. The purpose of this conversation, let's agree, when I use the term inner guard rails or IGR, I'm really talking about just the flare portion in advance of the through truss bridge structure. And for the rest of the investigators on the interview, if you intend to talk about the inner guard rail system from one end of the bridge structure to the other, please distinguish that. But other than that, I'm always talking about the flare portion and primarily the flare portion.

So, for the -- this is for the both of you: when we talk about bridge structure, do we -- do you guys consider through plate girder bridges, their construction, are those types of bridges considered a bridge structure? And if not, why not?

MR. GAWRONSKI: I would say they're (audio drop) structure, but they're considered span type.

MR. HIPSKIND: Well, I -- Tomas, I missed some of that. Did you say that a through plate girder is a bridge structure?

MR. GAWRONSKI: It is part of their -- of a structure, but it is considered as span type.

MR. HIPSKIND: Okay.

And, Steve, do you have a -- are you in agreement, or do you differ on that?

MR. CHENEY: I agree.

MR. HIPSKIND: Okay. Well, what types of bridge construction are considered a bridge structure? Are the through trusses considered a bridge structure?

MR. GAWRONSKI: Again, those are --

MR. CHENEY: Yeah.

MR. GAWRONSKI: I would classify them as types, because a structure could have concrete approaches and let's say steel truss; however, combination of those would be considered a structure, but they will have two different types, which they breakdown further as segments in our bridge nomenclature that I described earlier with the Tempe bridge.

MR. HIPSKIND: And, Steve, where are you at on this?

MR. CHENEY: I agree. A bridge structure could be composed of several different span types, as Tomasz said.

MR. HIPSKIND: Okay. And -- okay, so here's where I'm coming from, gentlemen. When we read some of UP's bridge and structures drawing that talk about inner guard rails, the language there says that -- it says where and it says how -- a minimum length of 50 feet, and it goes into the spiking, the plating pattern of how that inner guard rail is to be fastened onto the track segment and like that. But it says it's -- it is there to protect the bridge structure.

And I -- what I'm trying to figure out is, what do we really mean -- in other words, how do we know that the flare portion of an inner guard rail are applied to the right bridges and that we're not missing bridges where you guys intend for them to be? That's really what I'm trying to get at, and it seems to me the pattern has been, well, Dick, if we're talking about through trusses, we expect that flare portion of the inner guard rail to be there. So are you guys in agreement with that assessment, or -- help me to stay on the right path with this thinking here.

MR. GAWRONSKI: I was trying to be a little bit more technical to make sure that we correctly identify the nomenclature that we are using for this interview. However, I would say that, in a sense, Dick, that you just described, the use of the word "structure" in that sense, in the standard that you were referring, it would be correct.

MR. HIPSKIND: So, for the through trusses, but not necessarily for the through plate girder type construction?

MR. GAWRONSKI: I think that would be both.

MR. HIPSKIND: Okay.

And, Steve, where are you at?

MR. CHENEY: Yeah, I think in that standard -- and, of course, our track department creates and maintains those standards and applies those standards; they are responsible for inner guard rails, including the head flare section -- that refers to the structure that that is going into.

MR. HIPSKIND: Okay. And we're all in agreement that the reason UP has this drawing, the reason they are so specific about the location, minimum length and all that, is the purpose of the flare portion of the inner guard rail is to -- if there's derailed equipment, is to constrain them, restrain them, keep them upright and inline, but avoiding a bridge strike; is that the main purpose? Is that why we use them?

MR. GAWRONSKI: That is correct.

MR. HIPSKIND: Tomasz, don't let me forget, I know there's another side to that story, and we will get -- we will come back to it.

When we talk about the inner guard rail being used to protect a bridge structure, can either of you address, are there certain types of bridges or bridge construction where it is not expected that the track department install inner guard rails ahead of those bridge structures? We've already talked about through plate girders, and we've talked about trusses, but is there other kinds of bridges where, if you were out high-railing with a track inspector or somebody, you just wouldn't -- you wouldn't take exception and you wouldn't expect to see an inner guard rail for that particular bridge location?

MR. GAWRONSKI: Yes. It is easier for us to identify the structures that need or have the potential need of protection with using the inner guard rail. However, other structures that do not require that would be timber bridges, concrete bridges in general with all different types, and steel bridges; for example, beam spans.

MR. HIPSKIND: And, Steve, you -- are you in agreement with that?

MR. CHENEY: I am. For inner guard rail, that is used sometimes -- I don't believe all the time; you could correct me on that, Tomasz -- for through type structures, and that would be a truss or a through plate girder that has structural components adjacent to the track. And you typically -- so we have inner guard rail on some of those structures, not all of them, and the place you typically don't see them at all would be structure types that aren't through structures, where you've got all the components, structural members down below, as Tomasz mentioned.

MR. HIPSKIND: Okay. And I want to go through some regulatory stuff real quick. Are either of you gentlemen aware of whether FRA has any track safety standards or bridge standards that mandate or regulate the installation of inner guard rails?

MR. GAWRONSKI: I am not aware of any regulations or (indiscernible) (audio drop) FRA in regards to inner guard rail installation.

MR. HIPSKIND: Okay. Thank you, Tomasz.

Steve, anything?

MR. CHENEY: I'm not aware of an FRA regulation related to inner guard rail.

MR. HIPSKIND: Okay. Well, I'll tell you, that makes three of us.

But tell me the effect or the expectation that, if UP has a drawing -- and, Steve, let me direct this to you first. When you're asked to oversee or to provide a design drawing for bridges -- not the ones that we don't expect there to be an inner guard rail ahead of the structure or on the structure, but when you design your drawings, do you stipulate in that drawing that this structure, this location, these spans will have an inner guard rail?

MR. CHENEY: We don't.

MR. HIPSKIND: It's not included on the drawing, but you know it's --

MR. CHENEY: That's correct.

MR. HIPSKIND: But you know it's out there in terms of an expectation either in the engineering department or the bridge and structures department.

MR. CHENEY: Yeah, we don't specify the installation of inner guard rails for structures on structures drawings or in notes. The inner guard rail standard is maintained by our track department, so they are responsible for installing inner guard rails.

MR. HIPSKIND: Well, okay, and I appreciate that.

Tomasz, is there anything you want to add to that?

MR. GAWRONSKI: No, I do not have anything to add.

MR. HIPSKIND: Okay. So one of the other questions we asked you in general was tell us the number of bridges that are out there where you expect to see the installation of an inner guard rail -- and, again, I'm talking flare portion -- and tell us the number of where those inner guard rails currently aren't -- are not there.

And I'm just going to -- I don't want to talk in specifics, but I think you guys gave us some numbers like there's 600 bridges that we think -- where they should be, and 400 of those and some change have the inner guard rail in place and maybe about a couple hundred that don't.

And so, Tomasz, did I get anywhere close on the numbers? And the question I have for you is, how did you guys come up with those numbers? What was the process, and how did you generate those numbers?

MR. GAWRONSKI: Okay, so the numbers that we provided should be -- and I may have to request a minor correction.

MR. HIPSKIND: Okay.

MR. GAWRONSKI: The total number of bridges that require the inner guard rail is 635, and 218 do not have inner guard rail installed. Question is how did we come up with the number; we ran a computer program that was using the current criteria that would require the use of inner guard rails, so with that program that would -- with the constraints that would warrant the requirement of usage of inner guard rail, that's how we came up with the numbers that I just summarized.

MR. HIPSKIND: And I appreciate that answer. Let me kind of restate it a different way and see if you're in agreement with it. You essentially ran a query through your bridge inspection records data, and did it indicate hits where the inner guard rail was noted as not there?

MR. GAWRONSKI: Yes. For the number of 218 that -- when it was not there, right? I just want to make sure that I'm clear. We plugged in, if you will, the criteria that meets our current standard and ran the query to come up with the 635 bridges, and then, through our inspection records, we've identified the locations where the inspectors indicated that the inner guard rail was not installed.

MR. HIPSKIND: Okay. All right, that's fine. And we kind of covered this in a previous panel interview, I realize that, Tomasz, but I just want to revisit. The basic process, your inspectors generally go out in pairs: one of them does the inspection; the other one does the recording, fills out the record, and they trade off and they do that. But is it true that when we're talking about the through truss type constructions, those bridges are inspected twice a year; that's the goal?

MR. GAWRONSKI: I would say that this is correct, but that does not apply only to through truss bridges.

MR. HIPSKIND: Okay. But it certainly does apply to a bridge like the Tempe Town Lake bridge; I think we established in a previous interview, it was regularly inspected twice a year.

MR. GAWRONSKI: Yes, it was inspected minimum of twice a year.

MR. HIPSKIND: Okay. And you didn't take any exception, and I'm going to guess there's support in the training of a bridge inspector that one of the -- you go through a multitude of things that you want them to look at, but one of the things you want them to look at and note on the report is if that flare portion of the inner guard rail, if it's missing, it gets tagged; it gets recorded on a bridge inspection form. Is that correct?

MR. GAWRONSKI: That is correct.

MR. HIPSKIND: Okay. And the other part of the process that stuck with me about when the bridge inspectors were describing how they do their work, they explained to me, they said, hey, Dick, we keep those items, we keep them on the inspection report, and when we go back out on a subsequent inspection, if that item has been repaired or corrected, addressed, then we take it off, and if it has not been, we leave that particular item, and in this case, absence of an inner guard rail on a track segment, we leave that on. Have I captured that correctly?

MR. GAWRONSKI: That is the general expectations, correct.

MR. HIPSKIND: Okay. And I just, just to note, and I'm about ready to move on, the notation on a bridge inspection record noted that May, I think it was 25th -- 23rd or 25th of 2016, they noted that the flare portion of the inner guard rail at the south end of the bridge in advance of the through truss was not there; it was gone. And so one of the things in the investigation we were trying to determine, well, how long had this thing been off? And we may have thought about it incorrectly, but it seemed to us that it was off and it was never put back on.

But I noticed in one of the answers in our document request, there was some thought by somebody at UP that the inner guard rail was actually put back in place, and then it was removed to facilitate some tamping. And can you give me a timeframe of when anybody thinks that happened? And the reason I ask is, I don't see where it ever came off the bridge inspector's report.

MR. GAWRONSKI: Okay. So let me clarify the nomenclature on the inspection report regarding the inner guard rail. Yes, you are correct: the date shows as the inspector verified visually on May 23rd, 2016, that the inner guard rail was (audio skip) in some segment, it is present, and in some segments, it is not present, and I would -- from what I see, locations that is identified as not present, the inner guard rail is not required.

MR. HIPSKIND: Okay.

MR. GAWRONSKI: Also, when I spoke with the bridge inspectors, they did not know that they had to identify the flared portion. They answered the questions on inner guard rail on the inspection report as affirmative, as being present on Segment D, C, and B, but they did not answer that as positive identification for Segment E and A because they thought it was not required at that location.

MR. HIPSKIND: Do you think that it should have been there though?

MR. GAWRONSKI: Yes, the inspectors should have identified the inside -- excuse me, the flared portion was not present at that location. However, they thought that it was -- work was being done, and therefore, they did not identify it.

MR. HIPSKIND: Okay. So let me just fast forward on the whole issue of bridge inspection records, the presence or absence of a flared portion of an inner guard rail, and put aside whether UP intends for there to be one there or not, but when -- I just want to go to a more general comment. If things appear on a bridge inspection report that are not bridge and structures related, has anything changed since either one of the Tempe incidents in terms of communication between the bridge and structures department and the track department? Are you aware of any changes or policy, or we do things different, or we're doing things the same?

MR. GAWRONSKI: We have the communication avenue or methods in place to communicate between the track and bridge, and since the derailment, I am not aware of any changes in our process.

MR. HIPSKIND: Okay. All right. Gentlemen, that about empties my cup on a lot of the inner guard rail stuff.

David, can I turn this over to you, and are you ready?

MR. RAYBURN: Yes. This is David Rayburn speaking. Before I begin with asking some design questions, I want to go back to a couple items on the inner guard rail.

Tomasz, Dick sent me an email basically showing that the type of structures where inner guard rails are recommended by UP policy are through trusses, pony trusses, deck trusses on towers, deck plate girders with span length over 100 feet, moveable spans, and other structures designated by the chief engineer. Is that -- that's correct?

MR. GAWRONSKI: That is correct.

MR. RAYBURN: Okay. How about through plate girders?

MR. GAWRONSKI: The through plate girders, if the span exceeds 100 feet.

MR. RAYBURN: Okay. Okay. Before I get into design, this is a good time to bring this up. When I work with entities like the Federal Highway Administration, before I ever write a proposed safety improvement recommendation, I always discuss it with them. I'm not sure that's how the railroad division works with the railroad.

But let me just throw something out -- the thought that I want you to think about in the future there is, there's enough variation in the application of this policy that it might be helpful to classify it as an A defect, the absence of a inner guard rail or the absence of a guard timber, because so much is at stake, it's crucial that the bridge be protected. Even though it's not a defect that would historically affect the structure of the bridge, in a derailment, it could definitely impact the structure of a bridge, as we see here.

But I want you and Steve to think about that, that -- and we can discuss it later, but it may be beneficial to classify it as an A or B defect so that there's no changes later on or misunderstandings, so to speak, so that if a bridge inspector sees a structure he thinks it's supposed to be on, or if he classifies it as an A or a B defect, that it immediately goes to the bridge construction people and the track people that it has to be repaired; it needs to be attended to, in other words.

So I want you to think about that in the future, and you and I are going to be having conversations later on, over the next few weeks, about different things, things that we forget to cover in this interview. So just think about that; I think that would be a good way to fix the problem, but I don't know every -- as much as you do. So we'll talk about that more at length.

Getting along in the interview, the whole purpose of forming a bridge group is to help people understand the concept of load path redundancy. Some of our higher-ups are used to dealing with highway bridge structure failures, and this issue of load path redundancy comes up quite frequently. In the AASHTO, which is the American Association of Highway and State Transportation Officials [sic], there's a requirement that when bridges are designed or replaced that the designers should use a load path redundant design if possible, and if not possible or if they choose not to use a load path redundant design, they should have a good reason for doing so.

Is everybody still with me?

MR. GAWRONSKI: Yes.

MR. RAYBURN: Oh, okay.

MR. CHENEY: Yes.

MR. RAYBURN: Anyway, that's the concept that the AASHTO and the Federal Highway use. But having said that, highway bridges lend themselves to construction methods using multiple beams, because you've got two 12-foot wide lanes at least that you're going to have to build the crossing for the highway to cross over. With a railroad, you've got a narrower piece of real estate that you have to deal with, with most often a single line track. I believe you told me there were probably 1,800 bridges that had multiple rails earlier.

Before I get into asking a broad, general description, I'm going to read you a definition real quick. This definition is on page 131 of the AREMA Bridge Inspection Handbook, and it talks about steel fracture critical bridge members: A fracture critical member, FCM, is a member in tension or with a tension element whose failure would probably cause a portion of or the entire bridge to collapse. When inspecting steel bridges, the inspector may be able to identify -- the inspector must be able to identify the FCM on sight or based on previous reports and drawings.

It goes on to say that fatigue is the primary cause of failure in fracture critical members, and then it gets down to the definition of redundancy: Redundancy is important, as it refers to the load distribution to members and member internal makeup. Redundancy, as it refers to load distribution, relates to alternative means to carry the load should a member or element fail. And then it gives an example: A four stringer floor system is redundant; a two stringer system would be fracture critical. A four eye-bar bottom chord is redundant; a two eye-bar bottom chord is non redundant.

And then it goes on to talk about internal redundancy: The difference between internal member redundancy and bridge load path redundancy is load path redundancy is talking about transferring the load from a major element that fails; internal redundancy is talking about building up certain parts of the member so that the member itself is load path redundant, not the entire bridge.

As an example, it says: Internal member redundancy exists when a member contains several elements which are mechanically fastened together so that multiple load paths are formed. Failure of one member element would not cause total failure of the member. A riveted stringer consisting of a web plate and four flange angles is internally redundant; should a crack develop in one flange angle, it will not travel into the web or an adjacent flange angle. In a stringer consisting of a web plate and welded flanges, a crack developed in a flange will travel across the flange and into the web until failure. Thus, the critical nature of inspecting welded members and the importance of fracture critical member inspection for welded members.

And these are just general definitions that I want you to keep in mind when we're talking about load path redundancy. And as I said, the purpose of this bridge group is to talk about bridge load path redundancy and how it -- and how the highway bridges are different and how railroad bridges are different.

So, in general, what I want you to talk about -- this question is to Steve Cheney. I know railroads were first -- bridges were being built in the 1850s, you had evolutions of material, availability of material. For instance, in highway bridges, back in the '30s and '40s and '50s, most of them were a lot of trusses, because steel was available up north; down south, highway was easier to -- concrete was easier to obtain. So a lot of things like that went into how a designer chose what type of bridge to build.

So basically, Steve, I want you to, in general, kind of talk about how a railroad designs a bridge, what are the things that go into it, and materials, availability of materials, distances that you have to cover with the structure, and just in general describe what goes into designing a railroad bridge. And then later on, I want you to relate it to why, in general, most of the steel structures are not load path redundant. And then --

MR. CHENEY: Okay.

MR. RAYBURN: Then we can go into some other discussions, but in general, kind of give me an open-ended answer and tell me about railroad bridge design.

MR. CHENEY: Okay, very good. The spans that we choose for bridge designs are driven by the length and depth of the spans required and that's site-specific, often depends on site constraints, so there's some circumstances where long spans, such as trusses, historically, or through plate girders, which is what we typically would use for very long spans, would have to be used. And those, by the definition that you're talking about, are non load redundant. It's the industry standard to use those types of span lengths for long spans where site-specific conditions dictate that that's what's required.

When we're not required to use a non redundant span, such as a truss, which we really don't build anymore, but more commonly today, a through plate girder, we use shorter spans, and those typically have more beams in them if it's a steel span. Of course, if we get really short, we use concrete spans. So where we're able to use shorter spans that would be considered redundant, have redundancy, we do use those type of spans for multiple reasons. But, in cases where we can't use shorter spans that have multiple beams, we have to use through plate girders.

MR. RAYBURN: Okay. Now, are there any states that require Union Pacific Railroad to use load path redundant bridge design over highways?

MR. CHENEY: There aren't. What we do, though, in our process is, any time we have to design a bridge over a highway, we communicate with the state, so we're constantly looking at their policy. We have to -- we provide a design to them for approval and in coordination with the state -- with the ACC, for example, in Arizona -- and we have a dialog on what those requirements might be. So if requirements were to change, our process would allow to identify that change and to incorporate a state level requirement into our design.

MR. RAYBURN: Yeah, I looked at one down in Houston when Tomasz was kind enough to assign some bridge supervisors and inspectors to show me around the other day, and that was generally the policy that they explained that when -- back 30-something years ago, when the (Indiscernible) 1960 was a crossing at grade, and then the (Indiscernible) wanted to create a grade separation that -- they basically wanted to get involved and actually design the bridge themselves, because they wanted to -- they wanted a concrete bridge, so they ended up putting like 15 chords -- it's a pretty long span, but it has, you know, like six piers in the middle and six on each end, concrete piers, plus the chords themselves, the concrete eye-beams. I think there's like 15 chords on it to carry the weight.

In general, I think, in the questions that I sent you for -- to look at, AREMA nor the FRA has any recommendation or requirement to the railroad to build a redundant load path structure over a highway; is that correct?

MR. CHENEY: That's correct.

MR. RAYBURN: And so, even though AASHTO, which govern highway bridges, has a suggestion or requirement -- in the bridge design specifications, it says: Load path redundant bridges should be used with multiple continuous spans, and if the designer chooses not to use that design, they should have a good reason for not doing so. But with the cities and states -- for instance, you work with Arizona Corporation Commission -- even though AASHTO has that requirement for a highway bridge, that requirement doesn't translate to a railroad bridge over a highway.

Now, given the definitions that we've discussed earlier, this particular span is long enough that -- I don't think it's load path redundant, the new span over the Tempe -- over Salado Parkway. The through plate girder is like 133 feet long, and from what I can tell looking at the plans, it's only got two chords; it doesn't have multiple beams. So, Steve, the question is, that bridge would not be load path redundant, would it?

MR. CHENEY: Not by, yeah, the definition that you've described there. It has two main structural components: the through plate girders on the side and the floor systems between those girders.

MR. RAYBURN: Yeah. Okay. And I think that's enough on general load path redundancy right now. So basically, if the city of Tempe would've said, we want a load path redundant design, you would've built it, but since they didn't ask you to, you built what was economical and functional -- you know, I'm not saying -- and, again, I want the record to reflect that in no way do we or are we saying that load path redundancy is analogous to something that's unsafe, because we realize that -- and you can go into that for a moment.

Basically, your bridges, because they were -- this bridge, this truss span, for instance, was built over 100 years ago, and basically, the railroad carries a much higher live load, and so they beef up their structures to handle the much heavier loads than highway bridges normally experience. And so I guess that would be an example of why redundancy, you feel, is not necessary; would that be a good explanation?

MR. CHENEY: Yeah, the span that we used over the roadway there is essentially the industry standard for that type of span length, and based on the constraints we had down below with roadway and utilities, that span length was set or driven by those constraints. So yeah, for that length of span, it was a through plate girder, which we would consider an industry standard. It does have what we call fracture critical members, which you defined absolutely accurately here before, David. And our experience with through plate girders, although those are -- they have fracture critical components, historically has been that they are an extremely safe structure.

MR. RAYBURN: Okay. That's a good explanation. Now, going back to the earlier discussion we had about inner guard rails, do you think that, in the end, y'all are going to have to install -- based on your policy, are you going to have to install a taper preceding the through plate girder in Tempe as well? When you do the taper prior to the truss, are you going to also have to do one prior to the through plate girder?

MR. CHENEY: Tomasz, you can correct me if I'm wrong here, but there would be a inner guard rail on the through plate girder span, and coming into the through plate girder span from the south end, there would be a flared section at the front end of that.

MR. RAYBURN: Okay.

MR. GAWRONSKI: Yes, yes. Correct, Steve. This would meet our standard requirements.

MR. RAYBURN: Okay. Thank you. All right, I'm going to get into some particular questions, and then just to everybody's understanding, on -- so if I'm on the bridge looking to the east or (audio disruption) south, then according to y'all's numbering system and your nomenclature, if I'm looking -- if I'm on the bridge looking at that span, the truss span, the Segment D, then the end post would be like joint number zero, the next article would be like joint one, and then where the two diagonals come together on the lower chord, that would be like joint two, and then we'd go back to joint one and then back to joint zero on the south end of the truss; is that the correct nomenclature?

MR. GAWRONSKI: Let me speak to that. Not quite. Just as you were describing, if you were standing on the geographic south end, our inspection records would actually reflect that very -- as you described, the L-0 would be actually L-4, and the reason for that is because we always go towards increasing milepost --

MR. RAYBURN: Okay.

MR. GAWRONSKI: -- starting actually on the north end, just so -- just --

MR. RAYBURN: Okay. So I've got a schematic I'm looking here, so -- one, two, three -- so we would start at joint zero or joint one?

MR. CHENEY: Zero.

MR. GAWRONSKI: The lower -- where the bearing would be on the south end would be L-4.

MR. RAYBURN: Okay. Yeah. So basically I want to call your attention to Joint L-2E; that would be the lower chord, joint number two on the east truss. You got two diagonals that are in tension going into the bottom chord, which is also in tension. Question is, would that be a fracture critical joint? Steve?

MR. CHENEY: Yes, we don't define joints as fracture critical, but you're correct that the members going into the joint are fracture critical, the two diagonals going into the number two joint, and then the two low chord members that go into that joint are fracture critical as well.

MR. RAYBURN: Okay. And if that -- if those two members failed at that joint, what would probably happen?

MR. CHENEY: If the two members fail at the joint, being fracture critical members, it's possible the structure would fail. We do have circumstances where we've damaged or destroyed fracture critical members, and structures haven't failed. So it's possible, of course, by definition, when you lost a fracture critical member that you could have a failure.

MR. RAYBURN: Yeah, I read the National Cooperative Highway Research Program Report 83 the other day talking about, if you do some finite element analysis that, historically, members that are classified as fracture critical may, in many circumstances, not result in a failure -- I mean a failure of the structure. So I know there is some -- you have definitions that are very conservative, and then sometimes they don't fail like you would think they would.

(Simultaneous speaking.)

MR. RAYBURN: Pardon me?

MR. CHENEY: Go ahead -- oh, I was going to say, you made a really good point before when you read the definition of fracture critical. It mentions components of members whose failure would be expected to result in the collapse of a bridge or inability of a bridge to perform its design function. So it --

MR. RAYBURN: Yes, just --

(Simultaneous speaking.)

MR. CHENEY: -- does encompass both of those --

MR. RAYBURN: It's a very conservative definition.

MR. CHENEY: Yeah.

MR. RAYBURN: In fact, as an aside, I know in Europe the highway agencies don't even define fracture critical steel members; they don't require fracture critical inspections at more shortened time spans like they do in the United States.

But anyway, having seen the drone screenshots that I sent you, Steve, it does appear that that joint at L-2E was destroyed. Does that appear the same to you?

MR. CHENEY: Yes.

MR. RAYBURN: Okay.

All right, Tomasz, a question for you. On Table 5 in the Bridge Management Manual for Union Pacific Railroad, it basically gives conditions one through six with, I think, condition number one being the worst -- let me refer to it so I don't misspeak. Let me refer to the table. I believe that's going to be Table 5 in the Bridge Management Manual. And you have a rating where number six, no repairs are needed, and it goes all the way down to number one where critical, urgent repairs are needed; consider limiting the load, the speed, or the usage of the bridge.

Steve, do you or, Tomasz, do you know what the condition rating of truss span D was?

MR. GAWRONSKI: David, off top of my head, I do not know. I will speculate that was rated five, but if you allow me to verify --

MR. RAYBURN: Yeah. Oh, yeah. We can -- you can --

(Simultaneous speaking.)

MR. GAWRONSKI: -- (indiscernible).

MR. RAYBURN: Yeah, you can just email later on, basically telling me what the conditions --

MR. GAWRONSKI: Understood.

MR. RAYBURN: On the inspection records, where you classify defects A through D with V (indiscernible) I didn't see anything on the inspection record that -- there weren't any Class A defects listed, were there?

MR. GAWRONSKI: You are correct. There were no A defects on the structure.

MR. RAYBURN: Yeah. Okay. So for this -- you two can listen to this question. Basically, if I was in your position and I heard about this bridge collapse, the first thing I would do is check the timetable and see what the -- if there were any load -- what the load restrictions are, look at the bridge capacity, and I would make sure that my bridge didn't get overloaded. The second thing I would do is check the inspection records to make sure that there weren't any critical, pre-existing defects that could've caused the span to collapse. Did either one of you gentleman do that in the hours or days after the collapse?

MR. GAWRONSKI: Yes, I did. As far as my duties, I did check immediately the inspection records. I looked at that. The first item that you mentioned, I did not physically go look at timetable. However, I did follow up on the conversation with the -- our transportation folks and looked at the timetable at the later date and verified that no -- that the structure was not overloaded.

MR. RAYBURN: Okay. Then basically, I'm going to -- I'm not going to get into analysis here, but I'm just going to say that the collapse of the bridge was characteristic with an impact into the side of the truss, and there were no records showing there were no pre-existing defects that would've caused it to collapse, and there were no records to indicate that it was overloaded, so --

MR. CHENEY: That's correct.

MR. RAYBURN: Dick has gone over some of these questions. The one I sent you the other day, have you been able to -- and the reason I ask, I asked a question, or I told you I was going to ask about the number of bridges over public roadways. I thought that might be easy to find because there's a grade crossing inventory number for every bridge that goes over the top of a highway. Were you able to get that number, or you still working on it?

MR. GAWRONSKI: Overall, yes, I thought I provided that number. And please allow me a moment here to look through my --

MR. RAYBURN: Yeah, it was only a couple days ago when I sent it to you. You may not have had time to attend to it.

MR. GAWRONSKI: Like I said, I thought I responded. And the total number -- highways -- yes, we do have 2,363. If I did not respond, I will make sure and follow up so you have an email copy of it.

MR. RAYBURN: Okay. Two thousand what?

MR. GAWRONSKI: Two thousand three hundred and sixty-three. And I would like to make a comment that this is public roadways and private. We do not differentiate between private and public, so there might be --

MR. RAYBURN: Uh-huh.

MR. GAWRONSKI: -- small farmer access --

MR. RAYBURN: Do you think there's a lot of those?

MR. GAWRONSKI: I would -- it's hard for me to speculate. I would say --

(Simultaneous speaking.)

MR. RAYBURN: What we could do is, you could just -- you could check those grade crossing inventory numbers, and you could just throw them out if they're private, because it's going to be a private crossing if it's got a private road going under it. I'm just interested in the number of bridges that have spans -- and, you know, you may have a bridge that has two different spans going over a public road, so I'm just -- you know, I don't want to try to get in the discussion on spans. Just tell me the number of bridges that have a span that goes over a public road.

MR. GAWRONSKI: Okay, David. I will try to refine the number.

MR. RAYBURN: And then out of that number -- this is going to be a little bit more difficult, but maybe not -- I want to know how many structures that are over public roads are non load path redundant.

And we'll just -- for purposes of this discussion, we're going to talk about trusses, through plate girders, deck girders; just the steel structures. We're going to assume -- and I went and looked at the stringers the other day and the concrete boxes, and I looked at the designs, and for purposes related to steel redundancy, I'm going to say that all your timber stringers are going to be load path redundant; all your concrete structures are going to be load path redundant.

So we're just talking about the steel structures, primarily the trusses, through plate girders, deck girders. So how many of those steel structures that are non load path redundant, how many of those cross over a public highway? And you can, you know, just get back to me when you can. I know you got a day job and -- but that would be something that I would be interested in.

MR. GAWRONSKI: Understood.

MR. RAYBURN: And we asked the other day that one question about the number of bridge collapses you had that were caused by a train derailment striking the bridge, and I think you told me y'all had eight.

MR. GAWRONSKI: That's what I said. I would like to make a correction after revision that the -- it was actually seven. One that I count was a substructure collapse (audio skip) so seven instead of eight.

MR. RAYBURN: Okay. So it's probably going to be seven.

MR. GAWRONSKI: Yes.

MR. RAYBURN: Yeah. And so I want -- I'm going to ask you another question here, and I think I put it in that list of things I was going to ask you today. The number of those collapses where the bridge inspection records show that the inner guard rail was not present --

MR. GAWRONSKI: Yes --

(Simultaneous speaking.)

MR. RAYBURN: -- out of those seven superstructure collapses, and you can also tell me what kind of superstructure it was, whether it was truss, plate girder, et cetera, and then you can also tell me, out of those seven collapses, how many of them did not have the inner guard rail present. If it was required. I'm assuming it was probably required on most of them.

MR. GAWRONSKI: (Indiscernible) --

MR. RAYBURN: And you can -- and that's not something you have to answer right now, Tomasz. It's just --

MR. GAWRONSKI: Just allow me a moment to make sure I verify that I have the accurate information.

MR. RAYBURN: Okay.

MR. GAWRONSKI: There was total of four truss spans -- I'm sorry, there was total of six truss spans and one deck plate girder out of the seven.

MR. RAYBURN: Okay

MR. GAWRONSKI: Four did not have inner guard rail, and --

MR. RAYBURN: Four?

MR. GAWRONSKI: Four.

MR. RAYBURN: So that means three that did and four didn't.

MR. GAWRONSKI: Three that did, four that didn't.

MR. RAYBURN: Okay. And we can visit about that later on. Now, on the kind of bridges that carry two or more tracks, I think you told me you had 1,290 bridges that had multiple tracks. What --

MR. GAWRONSKI: Correct.

MR. RAYBURN: Typically, what kind of -- typically, how many -- I'm not going to ask you the exact number. I just, for my own knowledge, I want to know, typically, what kind of superstructures do those have that are carrying multiple tracks?

MR. GAWRONSKI: Typically, those are trusses and through plates.

MR. RAYBURN: Through plates. Okay. I'm just referring back to some of my notes to make sure that I haven't forgotten to ask you anything. Those seven collapses, how many years does that time span?

MR. GAWRONSKI: That spans since 2004, and since we do not keep particular records, that was based on information from people that were here, including myself.

MR. RAYBURN: Yeah. Okay. And so, in addition to -- I don't know if I asked you this or not. Out of those seven collapses, we want to know what -- you told me how many had inner guard rail and how many did not: four did not; three had the inner guard rail. Total of seven collapses since 2004 through 2000 -- does that count -- that counts the Tempe collapse also, right?

MR. GAWRONSKI: Yes, it does.

MR. RAYBURN: Okay. So 2004 through 2020. Yeah, I looked at the preamble to -- in the FRA's regulations, when they first started the Railroad Safety Act of 2008, when they started requiring the railroads to have a bridge safety management program, they said there were something like 58 railroad accidents resulting from a bridge collapse from 1982 to 2008, like a 27-year period. I don't have a question there. I'm -- Dick, I'm going to go ahead and pass the witness, and you can either ask questions yourself or go to Ryan, however you want to do it.

MR. HIPSKIND: Okay. Thank you, David. I enjoyed the conversation there.

Geoffrey, you're up next, and then John, you'll follow Geoffrey.

MR. McCORMICK: All right. Thanks, Dick.

Geoff McCormick, ACC, where rail safety program is based in the State of Arizona. Got a couple of questions pertaining to the drawings. So we've seen in the pictures and other evidence that's been submitted as part of the investigation so far pictures of the south approach of the bridge missing the flare portion of the inner guard rails, and we've seen UP's drawings pertaining to inner guard rails.

And I'm specifically talking about Standard Drawing No. 4005E that was adopted 1995 and revised September 29, 2009, pertaining to the protection of -- in this case, it would be through truss bridges. And I'm looking also at a Drawing No. 4015F pertaining to the installation of inner guard rails including a flare portion on the approach to a ballast deck bridge. And, in both drawings, I'm seeing a Note 1 that essentially states inside guard rails are not required on bridges until a bridge or bridge deck is replaced or running rail is re-laid across the bridge.

So that appears to me to essentially be saying that perhaps maybe if you have bridges that the drawing states would otherwise require an inner guard rail that it's not required until substantial work is completed on the bridge. So could you please -- and I'm not sure which one of you would be most appropriate to talk about it, but could you please just kind of expound on that Note 1 and what that means for practical purposes?

MR. GAWRONSKI: So I'll speak to it first. As you pointed out that the Note 1 says if we substantial -- if we do substantial work, then the requirement is to install the inner guard rail. I can't speak to when the rail is re-laid across the bridge because that would be the track department function. On new bridges, when we (audio drop) deck, that gets flagged on our inspection report, and that information gets to -- again, it gets disseminated to track department, and it's up to their functionality. Since they're doing the work, they're monitoring the installation of inner guard rails at those locations.

MR. McCORMICK: Okay. So I appreciate that. So if you have a bridge that, in a bridge inspection, identifies it's missing an inner guard rail that the drawing shows, or a portion of the inner guard rail, in your view, does Note 1 essentially require that you do not take steps to remediate that until one of the two things is satisfied, either the bridge deck's replaced or running rail is being re-laid on that bridge?

MR. GAWRONSKI: I would say that's correct on the inspection aspect of it, yes. We are noting year that the deck was installed and whether the inner guard rail is present or not, and that's where our process on the inspection side stops.

MR. McCORMICK: Okay. To your knowledge -- and this might be a better question for the track department, but if -- can you tell us a little bit about how, from a management perspective, the interface works between the bridge department and their inspections? So it appears that some of the items you inspect, particularly the inner guard rail portion of your bridge specifications, falls to the track department. So can you tell us a little bit about how the management interface between the bridge department and the track department works in terms of ensuring what's on the drawings, the UP standards, is followed?

MR. GAWRONSKI: Okay. So I will -- due to my limitation of my responsibilities, if you will, and we really identify what it is. I understand that, in the past, inspection summary was shared with the track department, and since I took over, I did not do that as a summary at the end of the year. We do have a process in place that is -- to my best understanding, it is functioning, that we find track related defects, those defects translate -- or they get sent automatically to the track system, which TMP, track maintenance program I believe that stands -- planner, I'm sorry. Not program, planner.

MR. McCORMICK: So, when you identify a track defect in a bridge structure on a bridge inspection, that automatically shows up on the desk, essentially, of the track manager that's responsible for that territory then?

MR. GAWRONSKI: That is correct. It would have to be a defect, so just want to make it clear that like, for example, an indication of no guard rail on bridge segment track, that is not a defect; that is just a notation that it's not there. You would have to come from -- and I think you (indiscernible) a notation there, some of the defects from -- on the track side (audio skip) pertaining to rail anchors, they will be translated to the TMP, which is the track maintenance planner.

MR. McCORMICK: Okay. Thank you for that.

So my next question is, I have seen elsewhere in the investigation where some discussion was made regarding the function of inner guard rails versus the timbers, the guard timbers on the outside of the rail, and that they may serve somewhat of a redundant purpose in terms of ensuring that derailed equipment doesn't stray too far from the centerline and then damage bridge structures along the line of road.

So my question is this: so we talked about, since 2004, seven bridge collapses; four of them were missing the inner guard rail. Do you have any data on any -- have you had derailments on bridges that were missing the inner guard rail where those timbers acted to prevent the equipment from striking the bridge?

MR. GAWRONSKI: I can recall several derailments that -- on timber bridges, and I would say -- because you asked for timber; however, the concrete bridges that do not -- or not concrete, the steel deck bridges, right, because we are talking about the open deck structures that would have the guard timbers in place, that the trains -- the wheels would come off the rail, and the guard timber would be holding the train or the tracks -- the track, excuse me, on the ties still, which the observations that I recall -- I do not have statistics or numbers.

I know there is, in my (audio skip) experience as a director bridge maintenance on the southern region, went through several derailments of that type, the wheels came off, damaged the guard timber, or the guard timber seemed to be holding those wheels on the track. So I would say the answer would be yes, with personal experience supporting the fact the guard timbers can work as a preventive measure for more disastrous derailment.

MR. McCORMICK: Okay. You don't have any solid numbers on instance where that has functioned in that capacity?

MR. GAWRONSKI: No, I do not. We -- I'm not aware of us keeping track of statistics of this type.

MR. McCORMICK: Okay. So is that kind of institutional knowledge, I guess, for lack of a better term -- maybe that's the appropriate term; maybe it's not. Is that something that's local to the Arizona Territory or the Southwest Division, or is that something that goes further up the ladder at UP?

MR. GAWRONSKI: Well, I'm not sure. You kind of said local and then -- and it's -- I'm not sure (audio skip) that as far as -- I would say portion of it is -- it is a kind of (audio skip) between bridge team, I would say, to classify the -- for director of bridge maintenance and construction that we have. So it's not -- I guess I would say it's not localized. (Audio skip) answer the questions properly. I mean, if I'm not answering what you're intending to, it's -- if you could clarify, point me in a better direction.

MR. McCORMICK: Well, so maybe my follow-up question will kind of zero in a little bit better on where I was going. And that is, if the view is that the guard timbers perform the function of protecting a bridge structure as well as an inner guard rail, at what point do UP's drawings get changed to reflect that standard? And how would that process work?

MR. GAWRONSKI: That would have to be addressed through the higher-ups, if you will, so you would have to go to discussion with the chief engineers. And that (indiscernible) be championed by Mr. Mancuso.

MR. McCORMICK: Okay, very good. I only have one other question, and again, this might be more appropriate for track, but I'll ask for the bridge folks' perspective on it. So, in light of Note No. 1 on your drawings pertaining to the inner guard rails, we know we had two derailments at the Tempe Town bridge; the first one involved the wide gauge derailment that essentially un-spiked and pushed out one of the east rail on a substantial section of the structure.

So my question is this, and you can just answer from the bridge perspective: Would having to mobilize the men and equipment to that site to re-lay that east rail after the derailment be sufficient to invoke Note 1 and invoke the conditions necessary for repairing -- completely repairing the inner guard rail as it's required to be on the drawing?

MR. GAWRONSKI: So --

MR. McCORMICK: My question is, since they were there to re-lay a rail post-derailment, would it not make sense that the inner guard rail should also have been repaired at that point so that it's in conformance with your drawing? And it would be 4005E for the steel section, and of course, you had the ballast deck section, so that would be 4015F.

MR. GAWRONSKI: Right. So, Geoff, you're just referring to the flared portion of the inner guard rail, correct?

MR. McCORMICK: You know, correct, because the flared portion was clearly missing, and we see some video from the lead locomotive that showed that there wasn't any guard rail on the ballast deck portion either, so that's kind of an open-ended question to me as far as how much of the guard rail was actually still there at the second derailment.

But, you know, at the end of the day, I mean, the question is, since they were there after the -- at the first derailment to re-spike the rail, once that job was done to recover from that derailment, should -- per Note 1 of the drawing, should the guard rails been restored to -- as they're represented in the drawing at that point?

MR. GAWRONSKI: Yeah, as you mentioned before, I think that would be a better question for the track, but according to just looking at the standards, the flared section should be (audio skip) did mention it on the ballast portion of it, it wasn't there, right, but it's not required to be on the ballast portion other than at just the flared section. And I was under the (audio drop) and I might be incorrect on that, that the portion that was on the open deck section of the bridge, the inner guard rail was still present.

MR. HIPSKIND: Yes.

MR. McCORMICK: Okay. I just had one other question, and this is from the organizational perspective. What -- how does the bridge department enforce accountability on bridge standards pertaining to the portion of the bridge standards that the track department's responsible for maintaining?

MR. GAWRONSKI: We -- again, I -- we identify the defects, and they are -- and I did verify that the defects pertaining to the track are translated to TMP. And, as far as enforcement, those are two different departments, so it would be up to the track department to decide what (audio drop) those defects.

MR. McCORMICK: Okay. Fair enough. I think that was all that I had.

Richard, I'll turn it back over to you. Thank you.

MR. HIPSKIND: All right.

MR. McCORMICK: Thank you, gentlemen.

MR. HIPSKIND: Thank you, Geoff.

And just so everybody knows, you're probably going to get a second round. But let's continue around the table for the first round. I know people have got questions.

But, John, can we hear from you next?

MR. ALLBERRY: Yeah, I don't have any questions. I mean, this is a lot outside my scope as far as bridge stuff.

MR. HIPSKIND: I, I --

MR. ALLBERRY: They answered pretty well there.

MR. HIPSKIND: Yes, and I realize that, and I know that you guys are riveted to our conversation. But thanks, John.

And, Jason, any questions from you?

MR. TAULLIE: No, sir. I have none at this point.

MR. HIPSKIND: All right. Thanks, Jason.

And Ryan B, any comments, any questions from you?

MR. BITTNER: No, I'll go along with what Allberry says. Out of my scope.

MR. HIPSKIND: All right. You guys try and stay awake now.

We have quickly moved around the table to you, Ryan, so let's hear from you, your questions, your comments. And then --

MR. FRIGO: Okay, great. Thanks, Dick.

Tomasz and Steve, thank you for answering everybody's questions. A lot of what I had was covered, but Tomasz, you mentioned something maybe about a half hour ago that perked my interest, and you talked about that there was a mechanism in place to communicate with the track department, and I was wondering if you could elaborate further on what that is.

And I believe it was a question that Mr. Rayburn was asking you, if there was something notated on an inspection and, you know, something was missing -- again, I just want to -- you know, some further elaboration on what that communication means. Is that just picking up the phone and calling your counterpart, or is there actually a formalized process where you can document open items and track those items through completion?

MR. GAWRONSKI: Okay. So we have two systems; one is called the BMP, bridge maintenance planner, and then we have the second system, TMP, track maintenance planner. And certain defects which would be typically related to track components, such as approaches or, for example, rail anchors, our inspectors have the capability of identifying those as defects. And those defects in particular would be transferred or translated to the TMP, the track maintenance planner. Of course, not to say that all the defects related to bridge are translated to the BMP, the bridge maintenance planner.

MR. FRIGO: Okay. And once something -- let's say an item that a bridge inspector picks up goes into that track maintenance planner. Is there anyone on the bridge side that continues to follow up with that item to ensure that it's mitigated?

MR. GAWRONSKI: Usually. And I will -- this will be a (audio drop) answer, and I will use an example to illustrate. For example, we have a low approach, which could be identified as a defect on our end. However, the low approach is caused by defective timber back wall (ph.); the back wall is leaking. So, in those situations, the manager bridge maintenance could or would contact the manager track maintenance and, with combined effort, they would respond to fix that defect. That's our expectation.

Now, for rail anchors, for example, most likely, there is no required, if you will, follow-up, unless the manager bridge maintenance would deem that that particular defect is critical or important enough to make a personal phone call to the manager track maintenance, respond to that defect.

MR. FRIGO: Okay. And do you know if, do any other departments look into either of those two databases to get -- to view the open items and any tracking to completion? Are you aware of any other departments?

MR. GAWRONSKI: Could you be more clear on other departments, like signal or --

MR. FRIGO: Sure. Would the signal department have any interest in looking in those databases?

MR. GAWRONSKI: No. From what I understand, I -- and I will speak based on the experience and my memory in the past, which really, for past more than 4 years, I did not use this system individually due to my position that I was holding. But I think the bridge maintenance managers have a capability to look at -- for sure they have a capability of using or looking at defects in BMP, and that's actually how they schedule their work. But I do not think they look and check -- actually, I am certain they do not look at the TMP. That would be specifically routed to the manager of track maintenance, the TMP system.

MR. FRIGO: Okay. And did -- what about the safety department? Do you know if they take a look at any of those databases and, again, open items that -- how many open items there might be or what the severity of those open items might be?

MR. GAWRONSKI: No, I think that would really defer to the safety team to answer that question.

MR. FRIGO: Okay. Thanks, Tomasz.

And, Steve, do you have anything to add to those questions?

MR. CHENEY: Just to reiterate some of the things Tomasz said. Thanks for asking. The processes are in place there where, if you have a bridge inspection and defects are identified, they go into the BMP, the bridge management [sic] planner, and those comments or anything relevant to the track stuff can be pushed over to the track side, that database, and vice versa, from the track over to the bridge side. And then the process is created, and the expectation is that those actions are communicated between those groups and that any issues are rectified and closed out.

MR. FRIGO: Okay. And, Steve, is there -- and I just want to, again, clarify this for myself and for the record. But it doesn't sound to me like there is a formalized meeting or discussion between the bridge group and track group to discuss these items. Is that correct? Is it just on an as-needed basis?

MR. CHENEY: I probably am not the right person. I'm not close enough to that to probably answer that question. There's certainly an individual basis for, you know, circumstance discussions that occur between those groups. In terms of a more formal process for it, I don't have the expertise to answer that question.

MR. GAWRONSKI: I can add a little bit, again, based on my past experience, that we do -- as the leadership team, we do expect the MBMs and MTMs at least once a year get together and look over the territory. The focus of those inspections is to review all vulnerable structures and, of course, not written in specific documents, the expectation is that these guys communicate about the combined efforts for their maintenance efforts on their individual territories between the MTM and MBM.

MR. FRIGO: Okay, Tomasz. Thank you. That helps me understand that.

I just want to move to one other area. You mentioned before that there was a certain number of bridges that, according to a search of the database, should have the inner guard rail installed but do not; do I have that correct?

MR. GAWRONSKI: Yes.

MR. FRIGO: Okay. And is there discussion internally about a plan to address that?

MR. GAWRONSKI: I don't think it's -- I'm in a position to say, you know, exact the answer to the question. And not to evade it, but I provide the report for where the inner guard rail should be installed, and my understanding is that that goes to the higher levels, and it is, again, evaluated by the track team.

MR. FRIGO: Okay, Tomasz, thank you for helping me understand that.

MR. GAWRONSKI: Yep.

MR. FRIGO: Dick, I don't have any further questions at this time.

MR. HIPSKIND: Okay. All right. Thanks.

So, Steve Krause, any question or comment? How far have we veered off the path?

MR. KRAUSE: Well, we're still on track, I think. Let's use track instead of path.

I do have just two questions. The first one, you know, sticking with this inner guard rail and the track department and the bridge department, so the bridge department goes out and inspects a bridge and notes any deficiencies or lack of an inner guard rail; track department's responsible for it. To me, it begs the question, is the track department, in their inspections, are they taking note of the condition of that inner guard rail or if it's even there? It's their responsibility.

I completely understand why the bridge folks check to see if it's there; it's there to protect the bridge. Seems like a simple type thing that maybe could happen if the track department is inspecting and taking note on their own if it's there, that might be helpful. So, Tomasz, I guess the question's to you, if you know, is the track department inspecting the inner guard rail?

MR. GAWRONSKI: Steve, I can't really speak for the track department. I know they're inspecting the track, as required per FRA, but whether they take notation of the condition of the inner guard rail, I do not know.

MR. KRAUSE: Yeah, I suspect, since it's not in the track safety standards, they may not be. But that was one question I had.

The second one was in load path redundancy. It was a very interesting conversation; it really was. But I'm curious about why it's brought into this situation where a 110-year-old truss that was impacted and collapsed because of that, how the -- how load path redundancy is kind of working its way into this situation. And it begs the question for me, does the NTSB have other data? Are they seeing patterns with railroad bridges or something that we need to be aware of, and there's an accumulation of issues along that line, or is it just something that you thought needed to be talked about?

MR. RAYBURN: I can answer that, Dick.

It's -- we've been dealing with a lot of highway bridge collapses over the last few years where load path redundancy was not considered even though it was required to be considered by the AASHTO and the LRFD design documents, and so it just sparked an interest in this case, and mainly I formed this bridge group just to allay some of those concerns.

MR. KRAUSE: Okay. Thank you. That's all I had.

MR. RAYBURN: Yeah.

MR. HIPSKIND: Thank --

MR. RAYBURN: Dick, I've got a couple more questions before we -- do we have anyone else in line to pass off to?

MR. HIPSKIND: No. Let me -- I'll get to you here in just a second, David. So does the group want to take a break or do you want to push forward? We've been at this for about 2 hours and 10 minutes.

MR. McCORMICK: Here's a vote for a break.

MR. HIPSKIND: You want to take a break?

MR. McCORMICK: A short one, if we could.

MR. HIPSKIND: Okay. Why don't we take --

UNIDENTIFIED SPEAKER: A five-minute break.

MR. HIPSKIND: Let's take a five-minute break. I'll see you all back on here at quarter past the hour. And I do see light at the end of the tunnel, okay? We made good progress. I'll see you all in about five minutes. Stretch your legs, take a bio break, and see you here in just a little bit.

(Off the record.)

(On the record.)

MR. HIPSKIND: All right. Listen, guys, I very much appreciate the detail and the depth of everything that we've talked about so far, so let me jump around. I've got some notes here, and I want to be sure I close up this thing about the inner guard rails.

So here's where I'm at with the inner guard rails. I'm a little mixed up. It seems to me that there are no track safety standards governing inner guard rails, and that was kind of cleared up for me. Were the track inspectors, or were the FRA track safety inspectors, were they looking for the presence or absence of inner guard rails? And the long and short of it is, no. And it's primarily because it's not a regulatory item, and why would they take note of it? And we're getting a little bit of the same thing on the bridge and structures side: it's not a regulatory item, and if it's on the bridge, it becomes a bridge maintenance planning item, but if it's off the bridge, it's somebody else's problem.

And I think what we're missing here a little bit, or at least in my perception, is that, well, it's a UP standard. And we did spend a little bit of time talking about these drawings, and every time we look at these drawings, and I've highlighted it, it says to protect the bridge structure. But there's more beyond just those words about protecting the bridge structure, and here's where load path redundancy comes in: we know that some of these bridge structures are vulnerable. I mean, this is the story of the Tempe, Arizona, accident. Whoever thought that we were going to get a train off, it was going to strike a bridge, and we have a collapse?

The importance of the collapse and the vulnerability is, we have the interface of the public, and that's why David has asked questions about traffic patterns, and that's why Ryan probably asked questions about, well, the surrounding population and all those kinds of things, as well as the environment. So we're not sitting here today saying, you got to go out and do everything and you got to make these truss bridge constructions redundant. We're not crazy; that's not where we're going. What we're wanting to understand is, how do we keep the train on the track in the first place? We don't need to strike a bridge, and we don't need to prove to the world that certain bridges are vulnerable to a train strike.

So, Steve, I've got to ask you the dumb question: Can we build, can the railroad industry build, a through truss bridge that will withstand a bridge strike from a moving train?

MR. CHENEY: A through truss, is that the question?

MR. HIPSKIND: Yeah. You've got a couple different types of through truss bridges: riveted, pinned. Is it reasonable? Can we build a through truss bridge to withstand a train strike 20, 25 mile an hour?

MR. CHENEY: I don't think that we can guarantee that in all cases. Any truss that we would design would have fracture critical members in it. And if there's a potential with fracture critical members that you could have a failure. Historically, we've had very few failures, even when fracture critical members were damaged, but I don't think you could design a truss, practically design a truss to be failure proof considering the fact that it has fracture critical members, and really considering that all of our bridges, even things that aren't trusses, whether it be through plates or shorter spans with more redundancy, aren't 100 percent failure proof either. There's circumstances that could result in failure.

MR. HIPSKIND: And let me add this, too, and you -- everybody knows, I don't know how to design bridges, but in thinking about this accident and all the things that we've talked about, if we were to design a bridge, a through truss bridge, similar to the look of the Tempe Town Lake bridge, as we add members, as we add weight, as we add material to make that bridge more load path redundant, what we do is we create a challenge for the bridge structure itself to hold up itself, and thereby, we do decrease the load carrying capacity. Am I anywhere close on that, Steve?

MR. CHENEY: That's correct, Dick. That's a very good inference there, the fact that you have some offsetting challenges there. You've designed that structure to be safe, but if you were trying to enhance structural members to create more redundancy or to be beefier, then you create other challenges such as adding weight to that structure.

MR. HIPSKIND: So we're right back to what I consider at least an essential, fundamental problem that we need to kind of come to agreement on. And I don't want to leave this discussion today with the thought that the placement of inner guard rails, the flare portion, ahead of a through truss bridge construction is optional. I have never had the notion that it's optional. I understand it is not a regulatory item. I understand it may not -- because it's out on the track portion, it may not be a bridge critical item. I get that.

But it's because it is in the UP drawings, and it's because of the language in those drawings -- and I'm going to use this word; we need to get away from requirement and we need to get away from a lot of other stuff -- but it sure seems to me that it is a strong, strong company expectation that the flare portion be there. And I'm going to tell you why I think that. In our exchange of dialog and exchange of documents, I did notice that there were at least four drawings where -- that were revised and updat3ed on September 21st, 2020. And I think that's important to note for the following reason: this was like within two months after the Tempe Town Lake bridge collapse.

So, to Tomasz and to Steve both, I'm aware of those -- the wording and the changes and the revisions on those four drawings. Are there other drawings or something, other updates or changes that maybe I didn't specifically ask for that have been a result of the accident back on July 29th?

MR. CHENEY: Not that I'm aware of, Dick.

MR. HIPSKIND: And Tomasz?

MR. GAWRONSKI: Neither am I.

MR. HIPSKIND: But there were those changes and revisions, updates, in at least those four drawings.

MR. GAWRONSKI: Dick, that is correct, but I cannot speak for certain that that was the result of the Tempe accident.

MR. HIPSKIND: Okay. Yeah, fair enough.

MR. CHENEY: I would --

MR. HIPSKIND: Fair enough, guys. Are either of you aware or have you been notified of any changes or modifications in policy/practice over on the track side, and if they did, would you be made aware of those changes?

MR. GAWRONSKI: That's negative on my end.

MR. CHENEY: I personally would not, in my role, probably be made aware of those changes. But would certainly expect that other people would be.

MR. HIPSKIND: Yeah, and let me narrow the -- my choice of words there. I don't mean any changes in any aspect of track engineering; I'm really still on this subject of how are we going to address the placement/installation of inner guard rails ahead of bridge structures.

So let me move along pretty quick here. Tomasz, I know Ryan was talking to you, and I found it interesting, your characterization about the track maintenance planner and the bridge maintenance planner. And the way I understand it is, inspecting bridges is really, really important; it's an important policy and an important practice. But I don't think we've just pointblank asked you, why is it so important? Why is that a critical function of the bridge and structures department?

MR. GAWRONSKI: Well, mainly, it is the safety of the public and the railroad.

MR. HIPSKIND: And, to put it in laymen's terms, isn't the goal here to train these guys on how to make detailed inspections in order to find things in their infancy? Better to find -- it's the old "a stitch in time saves nine."

MR. GAWRONSKI: Dick, absolutely agree. And this is exactly what we are doing, I think, on our end. We're continuously training our inspectors. And for that very reason, we have the classification of defects -- A, B, C, D, and V as a monitor call -- in our inspection process to identify the progression of the defects and translate them further into the severity, how quickly we should respond or our maintenance teams should respond to mitigate those defects.

MR. HIPSKIND: Yeah. And I recall that David asked you a really good question about, well, when you reviewed these bridge inspection reports in your daily job, he asked you, well, were there any of those bridges coded up with a Class A defect, and you said no. And I expect one of your goals in life in your job is, you don't ever want to see anything get up to an A, and maybe not even a B; you're trying to more or less nip these things in the bud by identifying them as early as -- early on as you can.

MR. GAWRONSKI: Yes. To add to your comment, we classify further those A, B, C defects and translate them into the importance. So, for example, certain -- not all, but certain A defects will get higher priority, and in our process, we elevate them through email and possibly a telephone call from the inspector directly to the manager, so this is the level of critical or important defects that we would elevate.

Other defects are just noted, and they are -- through the engineers and the bridge directors are being translated appropriately to the maintenance levels, meaning how our maintenance teams is responding to it, at what frequency -- or urgency, I should say.

MR. HIPSKIND: Okay. And this gets back to your couple of acronyms, the TMP and the BMP. And really inherent in that is people talking to each other, people taking off the data from the bridge inspectors and addressing items either of maintenance or repair that need to be addressed. My question is, how long have both of those programs been in place?

MR. GAWRONSKI: Allow me to go by my memory. It was approximately when I was transitioning, I believe in 2006, into my job, but I was already -- the system of bridge maintenance planner, I was already using as a manager, so I would speculate that approximately 2004 (audio skip) initial stage of it, and then it got a little bit more involved and a little bit more complex.

MR. HIPSKIND: Okay, but it -- both of those systems, whether we're talking about bridge maintenance planner or track maintenance planner, there's an evolution. You guys can change them. You're not set in stone that you're not going to allow changes to either one of those programs, right?

MR. GAWRONSKI: That is correct. They're continuously changing based on feedback, based on the usage. I know myself and I would speculate that the other directors get feedback from our manager bridge maintenance, take that feedback, and try to make appropriate adjustment and changes.

MR. HIPSKIND: Okay. And so I want to make this observation that -- and, David, I'm not trying to steal your thunder here. If Union Pacific says, we have a priority, we have an expectation that the flare portion of inner guard rails needs to be -- those installations need to occur on the bridges that we've defined, whether it's on the old drawings or based on the language in the new drawings -- and David, he went over those with you about, well, it's going to be the through trusses; it's going to be the through plate girders over 100 feet. I suspect that there's going to be more locations that probably will be revisited or discussed in the coming weeks and months.

My observation is, if you were to choose to tell your bridge inspectors, well, yes, it's out there on the track segment, it's not a bridge and structures issues, but if that inner guard rail's missing, a train gets off, strikes the bridge, takes the bridge down, we got a big issues. So my point is, if you would choose to elevate the absence of an inner guard rail, whether it's track portion or not, that is something that your other programs would naturally address in terms of communication, automatically notifying guys, somebody putting a tracking timeline on the repair. How far off am I on that concept?

MR. GAWRONSKI: And I think, Dick, you are referring to is the how our defect is being translated to the TMP.

MR. HIPSKIND: Exactly, exactly.

MR. GAWRONSKI: Right, so that is a decision is made by our company, at what level those are decided to be translated. And I think we, on our end, on the bridge side, we relying on the track folks to tell us how important that is, what priority list or where in priority order this particular defect will make it into their planner.

MR. HIPSKIND: Okay. And let me tell you what I see one of the obstacles being: you guys could be very dutiful in putting on a bridge inspection report, like we see in this accident, that the flare portion on the track segment is missing. And I'm just going to take the role of a director of track maintenance. If you call me up, and you send that over to me, I'm sitting there looking at that, and I might just say, is there a Federal Regulation that says I have to put that on there? No, there is not. And I may just put that so low on my list of everything I've got going on that I'm trying to juggle for railroad safety, public safety, it may never get to the top of the list, and I may never get to it.

And so I think we're stuck in getting hung up in words about defects and expectation and regulation, and I would just hope that there's more discussion and great communication. And I don't mean to paint the two departments as in silos, but at the end of the day, we surely don't want to have the inner guard rail absent from a through truss structure if the intent of the inner guard rail is to protect the structure. Do we?

MR. GAWRONSKI: Agree.

MR. HIPSKIND: Okay. Now, I said earlier I was going to give you an opportunity. I know we -- when NTSB goes out and looks at these things, we often look at other countries and what are they doing there? And David alluded to he's looked at some stuff in Europe, I know we also looked at some stuff up in Great Britain, Ryan I think took a look at something in Canada, and I think David also shared a document from Australia on railroad safety.

And I do want to give you an opportunity. I argue that the importance of the inner guard rail, it's kind of better to have it than not have it. And I am biased. I'm biased by what I saw in Tempe, Arizona; I'll be very candid with everybody about that. But there is another side to the story, and I want to give you an opportunity to talk about that.

MR. GAWRONSKI: So question that I had, you were so kind to share with us the video, and I must say, I've watched several times. My computer, the company computer software that runs the video is rather limited, and maybe I should pose it to you as a question: Does the NTSB think that the derailment happened or were the cars entering the bridge already far enough off in order to cause the derailment on the Segment D, which was the truss? And I kind of on purpose -- I guess I'm asking for that clarification, because I had my observations in there --

MR. HIPSKIND: Well --

MR. GAWRONSKI: And I --

MR. HIPSKIND: No, go ahead. I'm sorry to interrupt.

MR. GAWRONSKI: And it was, I just visually -- and, again, I'm going to say I'm -- I did not have any more precise or higher level technology to be able to make a positive assessment. It was just an observation as I was watching that the derailment or -- the derailment might've happened -- point of derailment might've happened first. However, the cars are -- in my eyes, are coming off in the middle of the truss, off to the -- completely off to the side.

Then -- and I understand the point that the inner guard rail flare portion is not there, but as the -- as we're talking about, as the cars are entering the truss, they are still being very well lined into the structure, just the -- you know, obviously, it's almost like a split second, everything happens inside at the far end of the first truss. And I know we're talking a lot about the flare section; I -- you know, we (audio drop) out there. So I'm just kind of curious what the position of the panel is, or observation.

MR. HIPSKIND: Well, I think you've asked the right person. I have to be careful, because I don't want to speak for the Board or leave everybody with an impression that I'm stating the probable cause when it's in draft and -- but I would answer your question this way: there's probably nobody's looked at those videos more than me, and I would say a few things that are part of the factual portion of the investigation, which are, was the inner guard rail present? And the answer is no. And that's a function of, well, don't believe me; take a look at the head-end video.

The point of derailment, the broken rail, was within the limits of the length of the inner guard rail, had it been there. Okay? And that's the consensus POD. The footage shows cars in a awkward derailing position, a non-normal wheel/rail relationship, and does that -- do we see evidence of that prior to the cars getting onto the first span? Yes.

And I understand this is all subjective. And, when you look at the continuity, we're only talking about the movement of three or four cars out of the entire train: you're talking about the first tank car; you're talking the first lumber car, the second lumber car, and the third lumber car. And, when you look at that, the continuity is rather striking -- no pun intended. And there's just a very limited time for things to have occurred.

So I don't know if that answers your question, but it is -- it does, to me, explain why we talk about car movement, bridge strike, and all the ensuing collapse, et cetera. The collapse of the bridge was immediate, I would say, but -- anyhow, does that answer your question?

MR. GAWRONSKI: It helps.

MR. HIPSKIND: Okay, it helps.

So the last thing maybe I want to cover is, even if the bridge department does not consider the absence of an inner guard rail ahead of a through truss structure, even if you don't consider that a defect, and if it has to be a defect to engage the track department, I don't see how you're ever going to get there unless it's elevated and changed within your bridge maintenance planner or your track maintenance planner programs to where the communication is engaged. And I think -- well, anyhow. Any thoughts on that?

MR. GAWRONSKI: I agree, and just an observation and a comment, perhaps, that that would have to be -- I mean, I -- going back, I appreciate the track folks being able to identify and prioritize their defects, you know, what is important. Do I agree that there should be a communication on the -- on a company level? Perhaps, to prioritize those. Because on our end, of course we are very, very concerned about structural defects, like as we were talking about, fracture critical members. And that's where my inspectors, my team is very much so focusing on, because those are just direct potentials that would have an impact on the stability of the structure.

Again, the inner guard rail, that's -- you know, even if we see in this data is kind of -- you know, it's very subjective, I think, still. Even based on experience, we have situations that inner guard rail, if the wheel goes far enough, it is actually hindering; it actually -- it will launch the car or the equipment towards the structure, so there is that portion of the argument. So it's very subjective.

And speaking to that, the track folks or the team on the track side need to evaluate how important it is, and maybe that needs to be guided through, you know, high level of the company, because they do have a lot of other cause derailments, right? Rail especially, wide gauge, I think, if we look at the data. So they have to mitigate those. So I would imagine -- again, I'm speculating -- that they will have to have the ability prioritize how important it is.

MR. HIPSKIND: Well, I know that folks internally on some of the Class I railroads get together. I know you guys are getting together next week for a conference. But, Tomasz, are you aware among your peers, has -- do you know if anybody has studied the efficacy of the placement of the flare portion of an inner guard rail? Has that been anything that you've come across in your 23 years?

MR. GAWRONSKI: I am not aware of any study, other than perhaps I will mention that -- I did mention on the previous interview that we were looking at the, yes, efficiency or the application of the inner guard rail, which it was just a calculation/observation with the horizontal clearance of the structure versus where the guard rail, inner guard rail would be placed. And there is a short zone that it's effective, and of course, as I mentioned before, if the wheel goes past the center point and it hits the other one, it's actually -- it's going to hinder and launch -- cause more damage.

So there's that aspect, on our end, that at least we started looking. And this is very recent, and I believe that is -- it was instigated even before the derailment, something that we looked at. But prior to that, I am not aware of any studies or analysis of effectiveness of the inner guard rail.

MR. HIPSKIND: Okay, David, one more question, and I'm going to toss it over to you.

MR. CHENEY: Can I add to that real quick, Dick? I'm sorry to interrupt there. It's been a debated issue for some time. I agree with Tomasz in not knowing if there's a formal study, but there's certainly different perspectives on the effectiveness of inner guard rail. As Tomasz mentioned, depending on where the point of derailment occurs, if you're lined or your wheels are lined on the wrong side of the point of the flare, then certainly you get situations where you directed your train essentially into your through structure, right, into your truss.

There's other cases where, if you hit it on the right side, and if your assumption is correct to that point and the flare directs it back in the direction you want it to towards the rail, you still, once those cars are derailed, get tie bunching and things like that that can take those wheels out of that zone of the rail and the inner guard rail. And you can have sudden derailments when that happens, kind of like what we saw at Tempe where you get a car move very quickly.

So it's certainly been a topic of debate. I don't know about, like Tomasz, a formal discussion, but there's been cases where arguments, very strong arguments both ways on whether it's beneficial or not beneficial.

MR. HIPSKIND: Well, thank you for that, Steve. And, gentlemen, the country of Australia, their rail safety program, they tend to agree with you that there are pros and there are cons, and we have talked about them.

I want to move quickly. Tomasz, when you and David were talking about the seven derailments, I want to ask just one simple question: do we know, in those seven derailments, bridge failures, were there any fatalities, were there any injuries as a result of any of those incidents?

MR. GAWRONSKI: No fatalities and no injuries.

MR. HIPSKIND: Okay. And I mention that because I've talked to all of you about the Ashtabula, Ohio -- 144 years ago or thereabouts was the last -- I think the last known bridge failure that resulted in a fatality, so that's a pretty good safety record, and I did want to add that comment.

David, apologize for going a little bit long there, but I had some loose ends. I'll --

MR. RAYBURN: That's okay. You covered some of the areas that I wanted to cover anyway.

Tomasz or Steve, on the -- I know you're not a track person, but the guard timber on the outside of the rail, what's the dimensions of that guard timber? Is it 8-by-8 or --

MR. GAWRONSKI: It's -- Steve, let me (audio drop) think it would be appropriate if I said I will give a stab at it that it used to be 5-by-8, 5 tall and 8 inches wide, and I think, in recent years, we've modified that to be 4 inches tall and 8 inches wide.

MR. RAYBURN: Okay. The reason I --

MR. CHENEY: That's my understanding.

MR. RAYBURN: Over in the European Union, they use 300 millimeters tall and 300 millimeters wide -- that's basically 12-by-12 -- and, instead of using timber, they tend to use concrete. Of course, you have to watch your weight.

I don't know -- Steve, you can do some calculations on the side later on and tell me what a -- you know, you got a 100-foot span, you're talking about putting a concrete curb on both sides of the track, you know, 12-by-12, you can tell me what -- you know, calculate what that would weigh and how much -- would it actually put a penalty on carrying the live load, or if you got enough flexibility built into the system that it really wouldn't affect the live load. You can do that later on, but I'm just, I'm bringing that up for food for thought.

And that brings up a greater issue, and I'm going to have to do some more research, but the whole efficacy of the inner guard rail -- does it help, does it hurt, should it be there? I mean, somebody in UP decided a long time ago, this is probably a good idea. It's not always going to help us, but it's probably a good idea. And just like Steve said, he's looked at it a lot, and there's a lot of thought behind it. And generally, think it's a good idea. I mean, inner guard rails have been around -- look up the first patent on Wikipedia, it looked like 1895, so they've been using these things for over a century, and they use them in Europe.

So it may be that in cases where the inner guard rail doesn't work, it may be beefing up the guard timber or the guard rail might be sufficient to keep the wheel from going into the structure. I mean, you just have to look at the weight, how much (audio drop) is going to weigh. I know most of your spans are pretty short compared to some of the longer highway spans that are 5-, 600 feet long, but when you start adding concrete, you really run into some problems.

But do some calculations on that, Steve, later on and kind of give me a thought on that, if you think it wouldn't cause too much of a weight problem. I got some more --

MR. CHENEY: Okay.

MR. RAYBURN: I got the analysis; I got the dimensions of the guard timbers. The length of the inner guard rail out to the taper you all basically say should be at least 50 feet. I think Europe uses 18 meters, which is like 59 and change, call it 60 feet; little bit longer. Tomasz, do you know of any cases where you have a longer, or is it pretty much -- you just pretty much stick with 50 feet?

MR. GAWRONSKI: We pretty much try to stick with 50 feet. I have seen, and perhaps that was just lack of understanding maybe on some of the track folks, that they would do it longer, in fact. And that was usually due to, let's say, we had an approach of concrete ballast deck and truss was a little but further, the track folks just actually extended that inner guard rail past the abutment, which made it longer.

MR. RAYBURN: Okay.

MR. GAWRONSKI: Either wasn't there, like in the case of -- excuse me, in the case of the Tempe derailment, but rather, I've never seen it -- I don't remember seeing it shorter.

MR. RAYBURN: Okay. I've got a bunch of scribble notes here. That statistic you gave me about 1,527 bridges were replaced between 2011 and 2020, that was actually 1,527 spans, right?

MR. GAWRONSKI: No, that's bridges. (Audio drop) would be more, but it would be entire projects and entire replacement. I did not account for any (indiscernible) replacements or repairs or any other repairs; we have various categories. It was just purely what you asked; it was just entire bridge replacements.

MR. RAYBURN: Yeah. Because, I mean, if you replaced a span on one bridge -- let's say this -- we'll look at Tempe Town bridge, or the Salt Creek River bridge, whatever you want to call it. Would you consider that a bridge replacement or a span replacement?

MR. GAWRONSKI: That would be segment replacement, so yeah, that would be (indiscernible) ones, yes.

MR. RAYBURN: Yeah. So that 1,527, that's 1,527 segments.

MR. GAWRONSKI: Segments would be correct, yes.

MR. RAYBURN: Okay.

MR. GAWRONSKI: At least segment, if not more, yes.

MR. RAYBURN: I was going to say, if you replaced 1,527 bridges, I'm going to buy some railroad stock. Anyway, just an aside there.

Dick has a better feeling for this, but I want to ask the question: between the old drawings prior to September, you know, the inner guard rail design drawing, and the old drawing and the new drawing, were there any substantial changes to that? I mean like the type of bridges or -- you know, you revised the policy in September of 2020. The policy that existed before that, are there any substantial changes?

MR. GAWRONSKI: You're asking -- you're referring to the inner guard rail?

MR. RAYBURN: Yeah, yeah. You know, you revised the drawing in September of this year. The drawing that existed before that, are they -- are there any substantial changes?

MR. GAWRONSKI: No, I've compared the drawings, and I did not see any substantial -- actually, in fact, I couldn't find what's the difference. They -- I predominantly paid attention to few of the bullet points; they seemed the same. Same --

MR. RAYBURN: Okay.

MR. GAWRONSKI: -- with the specifications of what types of bridges, or structures here in this case, were identified; that did not change. That instruction came from our team, from the bridge team, so that remained the same.

MR. RAYBURN: Okay. This is another one of those food for thought things like I told you earlier about classifying the absence of the inner guard rail as a defect. If I were to make a recommendation to the CEO of Union Pacific Railroad to install all the inner guard rails where their policy says they ought to be, and please do it within 5 years, how much does it cost to replace an inner guard rail? I mean, you got a couple hundred of them that need to be replaced.

MR. GAWRONSKI: It would depend on the length. It's very difficult for me to speculate just because we don't do this type of work. I --

MR. RAYBURN: Yeah.

MR. GAWRONSKI: -- what the costs are, so it would be the track side.

MR. RAYBURN: Okay. Well, you can ask somebody -- you and Steve can ask somebody on the track side and say, hey, David Rayburn's considering writing a recommendation to get all this work done in 5 years; what do you think about that?

Hey, I'm just being straight up and tell you, you know, I'm not going to make a recommendation to you and not put a time limit on it. I'm probably not going to go out 10 years, but I -- you know, when I make a recommendation to Federal Highway -- like I made them go change all the signage planning in the City of Atlanta that they screwed up back in 1996 for the Olympics, and I gave them 10 years to do it. And I got overruled, and they did it in 5 years, but it cost them $12 million to replace all the signs on the interstates around Atlanta because the --

MR. HIPSKIND: Hey, David, I need to interrupt for just a second. I just got a warning on my end, I don't know if they're going to kick us off.

MR. RAYBURN: No, they won't kick us off.

MR. HIPSKIND: Okay. All right. Go ahead.

MR. RAYBURN: We go an hour past all the time on my meetings.

MR. HIPSKIND: Okay. All right.

MR. RAYBURN: I'm looking at --

(Simultaneous speaking.)

MR. ALLBERRY: Hey, Dick?

MR. RAYBURN: I'm going to get --

MR. ALLBERRY: Dick, just --

MR. RAYBURN: -- (indiscernible).

MR. ALLBERRY: -- myself and Jason Taullie are going to have to drop off here at 1 o'clock. We have a prior meeting we have to be at.

MR. HIPSKIND: Okay, understood. And thanks for being here and being part of the conversation.

MR. RAYBURN: Who's dropping off?

MR. ALLBERRY: John Allberry and Jason Taullie with UP.

MR. RAYBURN: Okay, okay. Let me check my notes real quick, and I'll give it right to you.

MR. HIPSKIND: Well, how about, let me go to Geoffrey, and we'll circle back to you.

MR. RAYBURN: Okay.

MR. HIPSKIND: John, do you have a question?

(No audible response.)

MR. HIPSKIND: I see your hand up.

(No audible response.)

MR. HIPSKIND: Okay.

All right, Geoffrey, do you have any questions you want to add at this time?

MR. McCORMICK: I just had one, so --

MR. HIPSKIND: Okay.

MR. McCORMICK: Tomasz, we talked about, I guess the inner guard rail drawings have been revised as of September of 2020, and my questions pertain to the Note 1 that essentially says that they're -- the inner guard rail's not required unless you're replacing a deck or re-laying rail on the bridge. So is that Note 1 still present on the documents that were revised in 2020?

MR. GAWRONSKI: I think so, yes. I think it is still present.

MR. McCORMICK: Okay. That was the only question I had. Thank you.

MR. HIPSKIND: All right. Thanks, Geoffrey.

And I'm assuming that John and Jason are both dropped off, so Ryan B, do you have any questions?

MR. BITTNER: No, sir, I don't.

MR. HIPSKIND: That was a no?

MR. BITTNER: Yeah, sorry, no. No, I don't have any questions.

MR. HIPSKIND: Okay, understood.

Ryan Frigo, we are back to you. Are you still with --

MR. FRIGO: Okay. Thanks, Dick.

So, Tomasz and Steve, I don't know if this is, you know, a question that you guys might be able to answer, but do you know when -- as part of the risk assessments that an inspector might perform on a bridge structure, do they notate any of the surrounding areas adjacent or under or within proximity to the bridge structure? Like would they notate that maybe there's a school or a hospital or a nursing home, you know, just any items like that? Does that come into account?

MR. GAWRONSKI: Let me answer that. Our inspectors do not make a notation whether there is a hospital or school or any nursing home. We do notate in general notes that -- we ask the inspectors to make some something that is really unusual, which those three would not really fall under that category, and of course, we are notating what the bridge is standing over or possibly under.

MR. FRIGO: Okay. What -- so what -- could you give me an example of what would a note that you might see on there might be?

MR. GAWRONSKI: There are several things that are standard, like for example, if there are utilities present. So that is a standard box that does not go in general notes. But over the time, when I review general notes -- even on this bridge, if you have a chance to look at the inspection records, kind of note the overall horizontal; sometimes we put notes over the vertical clearance. Inspectors in this case, for example, noted that piers three through seven were encased in concrete. So that kind of general notes.

Sometimes they will make a note about the general alignment changing, making records and notes of that, how that is changing. Let's say, for example, if the channel is starting to change its alignment and it's beginning to encroach on the embankment, which is maybe not part of the bridge but is part of the approach to the bridge, and making -- the inspectors will make an observation that possible erosion is happening that is not at the bridge but away from the bridge. So those would be maybe few examples.

MR. FRIGO: Okay. So it's -- so I'm accurate if I'm saying that the -- if my takeaway from this question is that the inspectors are really just looking at that bridge structure and any immediate potential impacts such as utility or potential erosion to that bridge structure?

MR. GAWRONSKI: That is correct.

MR. FRIGO: Okay. Is it -- do you know if there's any other mechanism where the -- that the railroad has where it looks at the built environment and how that relates to the infrastructure? Such as the -- you know, let's use the hospital, school, nursing home, you know, let's use that as the example. Do you know if the railroad has any other programs, inspections, risk analyses that look at those elements and how they might impact the existing infrastructure?

MR. GAWRONSKI: Well, interesting that you mention that. I think perhaps our real estate department might have some interest and some records to that effect, and I will defer further -- maybe for further comments to Steve, if you have knowledge or -- in that direction, Steve.

MR. CHENEY: I'm sorry, Tomasz. Could that question be repeated?

MR. FRIGO: Yeah, sure.

MR. CHENEY: I might've lost -- yeah, lost track of that.

MR. FRIGO: Not a problem, Steve. So I'm trying to get at the -- you know, we can use the example of a school, of a hospital, or of a nursing home, and do you know of any programs or any risk assessments or any other similar type practices at the railroad that might look at those elements and how they might interact with railroad, you know, if they're -- I think the real estate example is a good one, because knowing what's adjacent to your right of way -- do you know of anything like that, Steve?

MR. CHENEY: I'm not -- I don't. My focus, again, is pretty narrow on the bridge side, so -- it's a good question. On the bridge side, certainly, regardless of the location, we're designing bridges to the industry standard to be safe in any type of situation. That's really our goal and our practice, so that could be by a hospital, a school, or a nursing home, could be in a more remote location. But yeah, kind of your broader question, I don't know the answer to that.

MR. RAYBURN: Hey, Ryan, I --

MR. FRIGO: So the --

MR. RAYBURN: Ryan, this is --

MR. FRIGO: Go ahead.

MR. RAYBURN: Ryan, this is David. I stumbled on a good answer the other day when I was looking through Geoffrey's information from the Arizona Commerce [sic] Commission. Basically they -- UP had sold this property to the City of Tempe a long time ago, so when they got ready to rebuild this bridge, they had to get a permit from the city.

And when you look to those documents -- and this is also good for you to know, Steve -- every railroad that crosses over a highway is considered a railroad crossing. It's a grade-separated railroad crossing. And there's a DOT inventory number in the FRA for every one of the bridges that crosses over a highway. And those inventory --

MR. CHENEY: That's correct, David.

MR. RAYBURN: Pardon me?

MR. CHENEY: I said, that's correct. That's a very good point. I did not make that specific point before, but you're absolutely correct about that.

MR. RAYBURN: Yeah, and it lists, for instance, the one -- the grade crossing inventory form for this grade crossing shows that the school district travel through there. I think they interviewed the school transportation supervisor; he said he had like one special needs bus a day that travel through there, and then the elementary school had a few buses that went through there daily. And the grade crossing inventory form generally lists school transportation. It lists the ADT; for example, there's like 5,000 vehicles a day that go under that Salado Parkway span, Span No. D.

So I'll get with you more on that, Tomasz, because some of these derailments and stuff, I'm going to have you pull up the grade crossing inventory number, the ones that were over roads, and I'm going to do my own little risk assessment on there. And I may, in fact, if we can write the plan to do it on your computer system, all of those 1,800 bridges that cross public highways, if we can get it to spit out the DOT inventory number for those 1,800 crossings, I'd like to go look, read through every one of them and see what kind of risks -- special risks there are at those particular kinds of crossings.

MR. HIPSKIND: Hey, David, let me just stop you for a second.

Ryan, are you done asking your questions?

MR. FRIGO: Yeah, I think my cup's empty. Thanks, Dick.

MR. HIPSKIND: Okay.

And, Geoff, I see your hand up. Are you -- just want us to circle back to you before we stop?

MR. McCORMICK: Dick, I just wanted to -- I had something to add in regards to the questions about hospitals, schools, things like that. So David actually touched on most of what I had to add, which is the grade crossing inventory is a good database that you can potentially cross-reference with bridge locations in order to find some of those risk related data points. And another one would be quiet zones. So quite zone assessments contain a lot of that information as well, so between the grade crossing inventory forms and the quiet zone data, would give you a real good start at accumulating some of those risk management data points that you're going to be looking for in regards to bridges.

MR. HIPSKIND: Okay.

MR. McCORMICK: That's all I had.

MR. HIPSKIND: All right. Thanks, Geoff.

And sorry to interrupt you, David. Finish up what you've got, and then I'll poll the investigators, see if we got anything else, and if not, I'll proceed to close out the interview.

MR. RAYBURN: Okay. I'm looking at my notes. I'll be with you in just a second.

MR. HIPSKIND: Okay. Well, let -- while you're looking, let me ask Steve a question.

Steve, I just want to be clear that I know that the kind of cookie cutter bridge design that you guys put together -- is it true that the design stays basically the same, and maybe sometimes, like say on through plate girders, the only thing that changes is the length of the span?

MR. CHENEY: Yeah, primarily the length of the span and then the size of the components, as needed to be structurally sound and to be designed to AREMA specifications. So that could mean, you know, the webs are widened or the flanges are thickened, for example, on the through plate girder.

MR. HIPSKIND: Okay. And you probably have already answered my question, and you went right where I wanted the conversation to go, that when we talk about load path redundancy and when we talk about non load path redundancy, non load path redundancy does not mean unsafe, and one of the ways that you guys deal with non load path redundancy is that you oversize the beams or the material or the members that are used in the construction of the non load path. Is that -- have I got any of that right?

MR. CHENEY: Yes, I think so. And a good example of that, Dick, is just the fact that we design any new structure to E80 loading, what we call Cooper E80 loading, as specific by AREMA. And certainly, in most cases, we're carrying loadings that are below that loading, that maximum loading that we design everything for. And so yes, there is some amount of overdesign.

MR. HIPSKIND: Okay. And just explain again, and why is that important? Are you guys engineering, designing in a buffer, a safety factor portion in the design?

MR. CHENEY: You know, it's really meant to cover all circumstances and for consistency, so rather than designing to a different standard for different locations where car loadings could change, we just accept and embrace the industry standard and use that in all situations -- where we run heavy cars, where we run light cars, so that's essentially what we do.

MR. HIPSKIND: Well, I've kind of lost everybody on the video, so I hope you can still hear me.

MR. RAYBURN: We can see you.

MR. HIPSKIND: Okay, good.

Thank you, Steve. That's all the questions I had.

David, anything else to add?

MR. RAYBURN: Yeah, I just got one more question on the seven bridge collapses.

I'm going to get with you, Tomasz, and get you to get some of the train data as far as the train speeds and the, you know, the amount of tonnage that went over those particular bridges, stuff that -- I mean, we're only talking about seven different collapses, so just -- I just want to research the seven collapses that we do have to see if we got any common threads. I want to look at the speed of the train traffic, whether or not there were any reductions in speed, you know, what the track is used for, the amount of gross tonnage that goes through there.

And then you can get with me, Dick, on that, because I don't know the different kind of questions.

MR. HIPSKIND: Yeah, I'd be glad to, David. And I know that, in the course of this dialog, I know we still got a lot of work to do, but anything else, David?

MR. RAYBURN: One question. And this is to the FRA, and I'm going to ask it sooner or later anyway. I'll just kind of introduce it right here.

I'm just -- you know, I'm going to get asked -- Steve, I'm going to get asked why doesn't the FRA regulatory require these inner guard rails and guard timbers, so -- you know, we're going to have to do a lot of research on that, but I'm basically going to get asked that question, and I'm going to have to answer it, so -- I mean, I'm not asking you to regulate it at all; I don't care one way or another. But I'm just wondering why y'all never did.

MR. KRAUSE: Do you want a reply, David, or you want to talk about --

MR. RAYBURN: Oh, yeah, you can give it to me now if you want to.

MR. KRAUSE: Well, you know, that's a tough one. And it is a track component, and I'm on the bridge side of things, but I think the FRA's general theory on regulations is, if there's a need for the regulation -- if there's data, if there's accidents, if there's fatalities, if there's problems in the industry -- then I think the FRA uses that to jump in and write a regulation to try to stop the problem, stop the bleeding.

So I'm assuming -- and, again, I don't have any, you know, real history with this with the FRA, but I'm assuming that that has just never occurred, that the data's not there, there's not a industry need for it, there's not a big problem, so they've not recognized that there's a need for that regulation.

MR. RAYBURN: Yeah. The -- and keeping with that, the preamble to the Railroad Safety Act, in the FRA's initial rulemaking, they basically quote 58 train accidents associated with bridge collapses over a 27-year period, and I'm wondering if that old research is available, because I'm wondering if those bridge collapses were a result of trains actually hitting the structures or if they were a result -- I don't think that they were the result of in-service bridge failure; I'm thinking that all of them probably were the result of a train hitting the structure. Because all of the information that I have, there's only been a handful of railroad bridge failures due to some kind of in-service critical defect. Most all of these collapses are involving a train impact.

MR. KRAUSE: That could be, David. I don't know.

MR. RAYBURN: Yeah. You know, check with some of the old timers up there in Washington that might have access to that. I mean, somebody wrote that rulemaking, and they got that data somewhere. They may have it squirreled away.

MR. HIPSKIND: Steve, as long as we've got you on the video and talking, do you have any final comments or questions? Did we stay on the path today?

MR. KRAUSE: The track.

MR. HIPSKIND: The track.

MR. KRAUSE: I wanted to just bring up the inner guard rail issue. It seems like possibly a recommendation is being considered by the NTSB dealing with that, and that's fine, but take a look at what AREMA has to say about it. If you look at the language that they use -- and, as we all know, AREMA is industry based professionals; it's not an organization that does things lightly. I'm a part of it, a lot of people are part of it, and if you've been involved with it, every rule that's made is debated and parsed and chewed on for a long time.

So they don't put things out lightly, and what they put out concerning inner guard rails is, in my mind, a little bit light. And if they thought there was a real problem, I think they would've come out stronger. That's my opinion. But let me read what it says. It says, consideration should be given to the use of metal inner guard rails. Consideration should be given, is what they say. If you go through the AREMA manuals, there's lots of shalls and should, much stronger words; lots of shalls, lots of should, again. But what they say here is, consideration should be given to be used. And I think that's telling.

There is an ongoing debate -- there always has been; there probably always will be -- is there really a need, is there really a benefit to inner guard rails? It's a debated thing. And it seems tempting to say yes, if it had been there on the Tempe derailment, the bridge would not have collapsed. Very possibly true. But, again, it's not a clear black-and-white thing, and I think that is indicative from what AREMA came up with on their guidance.

MR. RAYBURN: Well, I would've -- two weeks ago, I would've said this whole thing is a very limited problem. But the more I read, I'm starting to see numbers like the FRA language when they first promulgated the rule back in 2009. They quote all of these railroad accidents involving bridge collapses, and so that's a significant number of collapses. And if you were to ask Tomasz how many bridge failures he had due to a critical defect, he's going to tell you zero, because I don't think there's any records in the last 50 years of a railroad bridge collapse other than like a washout, you know, a flood washout or an impact by a barge or an impact by a train.

I don't -- Tomasz, do you know of any bridge failures, in-service bridge failures?

MR. GAWRONSKI: We had close call, but no derailments that would lose a bridge due to bridge component.

MR. RAYBURN: Yeah. That's what I mean. So I'm thinking this, if you will, risk assessment points a whole lot more to train bridge collisions than it does anything else, and we need to get the academia and the people together to look at this, whether or not inner guard rails -- or how effective really are they, how can they be improved?

And just like I was posing the question to Steve about, you know, how much really would it affect the railroad if you put a 12-inch-by-12-inch concrete curb to keep the wheels from jumping the track, to keep the wheels from jumping outside after they derail, keep them from jumping into the truss. I know you got some clearance problems, but I mean, it may be a solution for everybody to consider.

MR. HIPSKIND: Ah --

MR. RAYBURN: I'm done, I'm done.

MR. HIPSKIND: -- on that note, David, do you have any more questions?

And, Steve, thank you for your input and your comment. I'm very appreciative that you were here today, so thanks. Thanks for that.

MR. RAYBURN: Yeah, thank you, Steve.

MR. KRAUSE: Certainly.

MR. HIPSKIND: Ryan, anything else from you?

MR. FRIGO: No, I'm all tapped out. Thank you.

MR. HIPSKIND: Okay.

Geoff, are you -- your cup empty?

MR. McCORMICK: I've asked everything I wanted to ask and then some. I appreciate it. Thank you, Richard.

MR. HIPSKIND: Okay.

Ryan B, anything else, parting shots here?

MR. BITTNER: No, sir. I'm good.

MR. HIPSKIND: Okay. All right.

Gentlemen, before I move to the close here, Tomasz, I'll let you go first, is there anything that you'd like to add or change to anything that we've talked about?

MR. GAWRONSKI: Yes, just minor modification here. Very early in the interview, I gave a mileage for our bridges, and I said I believe 418. I'd like to correct that to 408.

MR. HIPSKIND: Okay. Duly noted and duly corrected.

MR. GAWRONSKI: Thank you.

MR. HIPSKIND: Anything else, Tomasz?

MR. GAWRONSKI: No, I have no further questions or comments.

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

MR. GAWRONSKI: In fact, I interjected before, and you did answer that when we were talking about the derailment and watching the videos, and otherwise, I think all the bases are covered.

MR. HIPSKIND: Well, I hope you didn't take from that that I know what's going on in this accident. I just write about them; other people decide what's what. Do you have any suggestions for preventing a reoccurrence?

MR. GAWRONSKI: No, not -- I do not.

MR. HIPSKIND: Okay. And is there anyone else we should interview? And you already know we're going to talk to Jeff tomorrow, and we'll probably talk to Daniel Blank on down the pipe. But is there anybody else we should talk to to broaden our understanding, get more questions answered?

MR. GAWRONSKI: I think we touched (audio skip) subjects that -- and I think this is already part of the plan (audio skip) to get answers from the track department, because I know we referred to their expertise several times. (Audio skip) I think we --

there is nobody else that I can think of.

MR. HIPSKIND: Okay.

And, Steve, I'll start with, is there anything that you want to say before I ask these four questions, anything that's on your mind?

MR. CHENEY: No.

MR. HIPSKIND: Okay. So, Steve, is there anything else that you'd like to add or change to our dialog, our conversation today?

MR. CHENEY: No, I don't have any additional information.

MR. HIPSKIND: Okay. And are there any questions that we should've asked but that we did not.

MR. CHENEY: No, I think you were fully comprehensive.

MR. HIPSKIND: Well, thank you. On behalf of the team, I'll take that as a compliment. But it's not any one person here; it is the collective good. And I think we did have a great discussion today, as evidenced that we're already a half hour over our limit. So, gentlemen, we did a great job today.

Do you have any suggestions for preventing a reoccurrence?

MR. CHENEY: I don't.

MR. HIPSKIND: Okay. And is there anyone else that we should interview? And, again, you know we're going to talk to Jeff tomorrow, and we're going to talk to Daniel Blank about mid-April, something like that.

MR. CHENEY: No, not beyond those two individuals.

MR. HIPSKIND: All right.

So, gentlemen, I will send you -- after we get this interview transcribed, I will send you an electronic package that will contain an errata sheet and some instructions and all that, but if there are no other questions or comments, I want to compliment everybody on doing a great job today. I saw a lot of value that was added by people who do not work for NTSB; I saw a lot of value offered by people who do work for NTSB. And this is exactly what we want; we want -- in the party framework, we want this good, honest, candid dialog, and we'll figure out a way. And I'll close with saying, it's not about finding right or wrong; it's maybe about finding something better.

So, if there are no other comments, David, I will remind you to look to your recorder and save that file, and I guess I'm going to see just about everybody here again tomorrow sometime. So see you then, guys. Thanks so much for everything you've done.

(Simultaneous speaking.)

MR. HIPSKIND: All right, bye-bye.

(Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF: UNION PACIFIC RAILROAD TRAIN DERAILMENT, HAZARDOUS MATERIAL RELEASE, AND FIRE IN TEMPE, ARIZONA, ON JULY 29, 2020
Interview of Stephen Cheney and Tomasz Gawronski

ACCIDENT NO.: RRD20LR005

PLACE: Via videoconference

DATE: March 31, 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.

[redacted]
Autumn Weslow
Transcriber