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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.

Petitioner,

v.

iQAR INC.,

Case IPR2024-00543

U.S. Patent No. 10,882,399 B2

Deposition of CRAIG HOFF, PH.D.

Conducted Remotely

Thursday, January 30, 2025

10:01 a.m.

Reported by: Matthew Goldstein, RMR, CRR

DIGITAL EVIDENCE GROUP

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1 Deposition of CRAIG HOFF, PH.D., conducted
2 remotely:

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9 Pursuant to Notice, before Matthew Goldstein,
10 RMR, CRR, Notary Public in and for the State of
11 Maryland.

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A P P E A R A N C E S

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ON BEHALF OF THE PETITIONER:

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ON BEHALF OF THE PATENT OWNER:

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1 P R O C E E D I N G S

2 Whereupon,

3 CRAIG HOFF, PH.D.,

4 being first duly sworn or affirmed to testify to
5 the truth, the whole truth, and nothing but the
6 truth, was examined and testified as follows:

7 EXAMINATION BY COUNSEL FOR THE PETITIONER

8 BY MR. CHOWDHURY:

9 Q. Excellent. Thank you.

10 Good afternoon, sir, or morning,
11 wherever you're located.

12 A. I'm in southeast Michigan. So it's
13 still morning.

14 Q. Great. Good morning.

15 Could you please state your full name
16 for the record?

17 A. Craig John Hoff.

18 Q. And, Dr. Hoff, my name is Ryan
19 Chowdhury, and I represent the petitioner in the
20 inter partes, or IPR, proceeding relevant to
21 today's deposition.

22 Just for the record, that IPR is

1 No. 2024-00543, which is pertinent to U.S. Patent
2 No. 10,882,399.

3 And just before we get started, can you
4 please let me know what documents you've brought
5 with you to this remote deposition?

6 A. I've got PDFs -- clean PDFs of my
7 declaration, I have a copy of the '399 patent, and
8 I have a copy of the Hongo patent.

9 Q. And these documents have no annotations,
10 markings, or any notes in them; correct?

11 A. Right. They do not. They're clean.

12 Q. And have you been previously deposed?

13 A. Not recently. It was 20 years ago the
14 last time I was deposed.

15 Q. Okay. And given your experience, I just
16 wanted to refresh your understanding of how
17 today's deposition will be conducted, just to make
18 sure we're on a level playing field.

19 Is that okay with you?

20 A. Yeah, please do.

21 Q. Okay. So you understand that you have
22 taken an oath here; yes?

1 A. Yes.

2 Q. And that oath requires you to tell the
3 truth, the whole truth, and nothing but the truth;
4 correct?

5 A. Correct.

6 Q. And you will do that here today?

7 A. I will.

8 Q. It is very important that we try not to
9 talk over one another. So if you will give me the
10 courtesy to get my questions out, I will extend
11 that same courtesy to you in responding
12 completely.

13 Can we agree on that?

14 A. I agree, yes, sure.

15 Q. And that's especially true in these
16 remote depositions because there is sometimes a
17 little bit of a lag or a lack of clarity when
18 someone is finished speaking.

19 So I will try my best not to step over
20 your toes; fair?

21 A. Likewise.

22 Q. And is it fair that if you don't ask me

1 to clarify a question, that you have a reasonable
2 understanding of what I am asking?

3 A. That's fair.

4 Q. And since the questions and answers are
5 being typed up by the court reporter, I would ask
6 you to audibly answer every question. So a nod of
7 the head is not sufficient. We would need a yes
8 in that instance.

9 Do you understand?

10 A. I do, yes.

11 Q. And your attorney, Mr. Herman, may pose
12 objections to some of my questions from time to
13 time. But unless he expressly instructs you not
14 to answer, you understand that you are obligated
15 to answer, given the oath you have provided;
16 right?

17 A. Understood. Yes.

18 Q. I will try to make a -- take a break
19 about every hour just so that the court reporter
20 and others can get up, take bio breaks, and do
21 whatever they need.

22 If at any point you need to take a break

1 during the deposition, will you just let me know?

2 A. I will do that, yes.

3 Q. And the only thing I ask is that if
4 there is a question pending, and absent an
5 attorney-client assertion, that you answer the
6 question before we take a break.

7 Will you agree to that?

8 A. Yes.

9 Q. Is there any reason you can't provide
10 your best, most accurate testimony here today?

11 A. There is not, no.

12 Q. No medications that would impair your
13 ability to testify?

14 A. No medications, correct.

15 Q. Great.

16 Let's turn to Exhibit 2007, which I
17 understand is your declaration in the '399 IPR.
18 Let me know when you have that document open?

19 A. It's open, yes.

20 Q. Please turn to page 75 of the
21 declaration.

22 A. Okay.

1 Q. And is that your signature on this page?

2 A. It is.

3 Q. And you signed this declaration on
4 November 4th, 2024; correct?

5 A. Correct.

6 Q. Did you review this declaration in
7 preparing for this deposition today?

8 A. I did.

9 Q. And at this time, do you have any
10 corrections that you would like to make to your
11 declaration?

12 A. No corrections.

13 Q. Let's turn to paragraph 203 of your
14 declaration. And just let me know when you're
15 there.

16 A. Okay. I'm at 203.

17 Q. In this paragraph, you state, and I'll
18 quote, "I also recognize that the '399 patent's
19 specification discloses the use of a vehicle's
20 current position to look up historical speed data
21 as an alternative to the calculation of power and
22 speed on a segment-by-segment basis."

1 Did I read that right?

2 A. You did, yeah.

3 Q. So you would agree with me that the
4 '399 patent describes using historical information
5 in determining a probable optimal speed; correct?

6 A. It does, yes.

7 MR. HERMAN: Objection; form.

8 BY MR. CHOWDHURY:

9 Q. And in the quoted portion of the
10 '399 patent in paragraph 203 of your declaration,
11 the probable optimal speed is used to allow a
12 vehicle to travel at a particular speed; true?

13 A. Let me read this -- give me a minute to
14 reread that whole paragraph.

15 (Witness peruses the exhibit.)

16 THE WITNESS: And then restate your
17 question, please.

18 BY MR. CHOWDHURY:

19 Q. Sure.

20 In the quoted portion of the '399 patent
21 in paragraph 203 of your declaration, the probable
22 optimal speed is used to allow a vehicle to travel

1 at a particular speed; correct?

2 A. I'm missing the distinction you're
3 trying to make. You're just telling me what it
4 says right here?

5 Q. So you quote Column 18, lines 4 through
6 9, of the --

7 A. Correct.

8 Q. -- '399 patent specification in
9 paragraph 203; correct?

10 A. Right. Correct.

11 Q. And in this portion of the
12 specification, do you see the last part references
13 a particular speed; right?

14 A. Yes, at a particular -- right. You
15 determine the power that would be needed to drive
16 a particular speed, yes.

17 Q. And prior to the quotation in your
18 declaration, you state, I recognize that the
19 '399 patent's specification discloses the use of a
20 vehicle's current position to look up historical
21 speed data as an alternative to the calculation of
22 power and speed on a segment-by-segment basis.

1 So my question for you is: When you're
2 referring to "calculation of power," is that
3 referring to the calculation of a probable optimal
4 speed?

5 A. The method requires calculating power
6 and, based on that power, specifying or
7 calculating a speed, yes.

8 Q. And that probable optimal speed is used
9 to allow a vehicle to travel at a particular
10 speed; correct?

11 A. Correct.

12 Q. So let's turn now to the cited portion
13 of the '399 patent specification in this
14 paragraph. Let me know when you have the
15 '399 patent, which is Exhibit 1001 in this
16 proceeding, open.

17 A. I have it open. And we're going to
18 Column 18?

19 Q. That's correct, yeah.

20 A. And that's 4 through 9?

21 Q. Correct.

22 A. I'm just rereading the section.

1 (Witness peruses the exhibit.)

2 THE WITNESS: Okay.

3 BY MR. CHOWDHURY:

4 Q. So starting at around line 9, the
5 '399 patent says, "For example, in the past, a
6 driver may have driven a particular segment 1000
7 times. Out of those" --

8 A. Right.

9 Q. -- thousand times, she may have driven
10 it at speeds ranging from 80 kilometers per hour
11 to 120 kilometers per hour.

12 Do you see that?

13 A. Yes.

14 Q. And in the -- the next sentence reads,
15 For each of those 1000 times that she drove the
16 segment, the car recorded how fast she drove it,
17 and how much energy used. Therefore, to estimate
18 how much energy would be required to drive the
19 segment at 95 kilometers per hour, the power may
20 be estimated by taking an average of all of the
21 previous times the driver drove that segment at
22 95 kilometers per hour to arrive at an estimated

1 energy usage, rather than calculating the power
2 from the physics calculations, as described above.

3 Did I read that correctly?

4 A. You did.

5 Q. And based on this description, you would
6 agree with me that the '399 patent describes using
7 historical information associated with a segment
8 to calculate power to apply to a vehicle; correct?

9 MR. HERMAN: Objection.

10 THE WITNESS: I would, but it's based on
11 previous calculations from previous trips.

12 BY MR. CHOWDHURY:

13 Q. Thank you for that.

14 A. A key part -- I'm sorry.

15 Q. Go ahead.

16 A. No, no. A key part of this patent is
17 that the device calculates power. And if it's
18 done the calculation in the past, it would
19 naturally record that power or express it as
20 energy, which is an alternative way to express it.

21 Q. I appreciate that description.

22 Is it your opinion that the description

1 in this portion of the '399 patent represents an
2 example of calculating power?

3 MR. HERMAN: Objection; form.

4 THE WITNESS: I should answer?

5 I heard an objection. Do I go ahead and
6 answer?

7 BY MR. CHOWDHURY:

8 Q. Yes.

9 A. Okay. So restate your question again,
10 please.

11 Q. In the portion of the '399 patent we
12 just read together, is that an example of a power
13 calculation?

14 A. It is an example of using previous power
15 calculations. It is an alternative to doing a
16 realtime power calculation by relying on previous
17 power calculations.

18 Q. And that's one example of a power
19 calculation that's described in the '399 patent;
20 correct?

21 A. It seems clear to me that it's saying
22 it's an alternative to doing a realtime power

1 calculation to rely on previous power
2 calculations. So there is a power calculation
3 involved here.

4 Q. Thank you. I guess my question was a
5 little different.

6 Is it your opinion that the '399 patent
7 describes various examples of power calculations?

8 A. Yes, in great detail it explains power
9 calculations, yes.

10 Q. And the technique that's described in
11 this part of the '399 patent, Column 18, lines 4
12 through 24, that's just one example of a power
13 calculation that's described in the '399 patent;
14 correct?

15 A. I would word it differently. It's an
16 example of how to reuse previous power
17 calculations. It is not in itself a power
18 calculation that's described in the rest of the
19 specifications of this patent.

20 Q. But it is an example of a power
21 calculation, one type of power calculation; right?

22 A. You can construe it that way, yes.

1 Q. Let's now turn to the next paragraph
2 that starts at line 25.

3 A. Okay.

4 Q. And here the '399 patent says, Figure 5
5 describes one method of using historical data to
6 determine a probable optimal speed.

7 Do you see that?

8 A. Yes.

9 Q. So this is one example of using
10 historical information to calculate a power to
11 apply to a vehicle; correct?

12 MR. HERMAN: Objection; form.

13 THE WITNESS: Give me a minute to go
14 back and refer to Figure 5 so I'm clear on what 5
15 is saying.

16 BY MR. CHOWDHURY:

17 Q. Sure.

18 (Witness peruses the exhibit.)

19 THE WITNESS: Okay. And then let me go
20 back to where we were.

21 Okay. Agreed.

22

1 BY MR. CHOWDHURY:

2 Q. So starting at around line 29, the
3 '399 patent says, Figure 5 shows that, the
4 location of the vehicle is periodically determined
5 (for example, via GPS, manual entry, et cetera),
6 and this location can then be used to determine a
7 historical segment corresponding to the location.

8 Do you see that?

9 A. Yes. That was read --

10 Q. So in this --

11 A. -- read properly. Okay.

12 Q. So in this example, GPS is used to
13 identify a current location of a vehicle; correct?

14 A. Correct.

15 Q. And when the '399 patent says "current
16 location," it's referring to a current position,
17 as measured by GPS; right?

18 A. Correct.

19 Q. And you would agree with me that the
20 current location that is identified by GPS is used
21 to determine a historical segment; right?

22 A. Yes.

1 Q. And that's because the '399 patent says
2 a historical segment is determined as
3 corresponding to the current location; fair?

4 A. Yes.

5 Q. And is your understanding from this
6 description that the correspondence is determined
7 by comparing the current location with locations
8 associated with prior trips that are stored in a
9 database?

10 MR. HERMAN: Objection to form.

11 THE WITNESS: Please restate your
12 question.

13 BY MR. CHOWDHURY:

14 Q. Is your understanding from the
15 description of Figure 5 that the correspondence
16 between a historical segment and the current
17 location is determined by comparing the current
18 location with locations associated with prior
19 trips that are stored in the database?

20 A. Yes, they have segmented -- they have
21 used that segment of the route previously and they
22 recognize it and they use it again as an

1 alternative to the main approach.

2 Q. And around about line 46, the
3 '399 patent says, "For example, the historical
4 information is queried to determine what speed the
5 vehicle was traveling every time that the vehicle
6 (or the specific driver of the vehicle) was in the
7 same segment going to the predicted destination."

8 Do you see that?

9 A. Can you read it one more time -- I'm
10 going to read it one more time.

11 (Witness peruses the exhibit.)

12 THE WITNESS: Okay.

13 BY MR. CHOWDHURY:

14 Q. And the sentence before that portion you
15 just read relates to a -- it says, "If the answer
16 is 'no,' then the database is examined to find the
17 historical information about this segment."

18 So my question for you is: In your
19 opinion, how is the historical information in the
20 database examined using the current location of
21 the vehicle?

22 A. Yeah, I'm rereading a little bigger

1 section here.

2 (Witness peruses the exhibit.)

3 THE WITNESS: Okay. Please ask that
4 question again.

5 BY MR. CHOWDHURY:

6 Q. In your opinion, how is the historical
7 information in the database examined using the
8 current location of the vehicle?

9 A. Well, again, this is -- implementation
10 as a possible use of historical data. And if it
11 recognizes that a route has been done before and
12 there is previous calculations stored in memory,
13 then it is alternative to use that in deciding
14 what optimal speed should be driven.

15 Q. And so the current location is used to
16 identify a historical segment; correct?

17 A. Correct.

18 Q. Okay. So around line -- let's now turn
19 to line 33 of Column 18.

20 And here, right around the middle, the
21 '399 patent says, As described above, every
22 segment may be divided into a finite number of --

1 sorry, strike that.

2 At line 33 of Column 18 of the
3 '399 patent says, "As described above, every route
4 may be divided into a finite number of segments,
5 and the more segments that the route is split
6 into, the more accurate the algorithms may be."

7 Do you see that?

8 A. I do.

9 Q. So here, the '399 patent is telling us
10 that a route has multiple segments; fair?

11 A. That the method will divide the route
12 into segments, yes, fair.

13 Q. And would you agree with me that
14 historical segments stored in the database are
15 part of a route?

16 MR. HERMAN: Objection; form.

17 THE WITNESS: They may or -- they may or
18 may not be.

19 BY MR. CHOWDHURY:

20 Q. So in the Figure 5 technique that's
21 described in Column 18 of the '399 patent,
22 historical segments are part of a route; correct?

1 MR. HERMAN: Objection; form.

2 THE WITNESS: So the historical segments
3 that are being used may or may not be part of the
4 current route, but if they exist, they can be
5 queried.

6 BY MR. CHOWDHURY:

7 Q. So the historical segments may be part
8 of a route; correct?

9 A. The historical segments might be part of
10 the current route and they may not be part of the
11 current route, but they still could be used.

12 Q. Okay. Thank you for that explanation.

13 Let's now turn at line 39, near the
14 right. And here the '399 patent says, It can then
15 be determined if the vehicle is in the same
16 segment as previously determined or if it has
17 entered a new segment 507 since evaluating [sic]
18 the vehicle location.

19 Did I read that correctly?

20 A. It can then be determined if the vehicle
21 is in the same segment as previously determined or
22 if it has entered a new segment -- yeah, right.

1 So the method here has got to be continually
2 evaluating what segment it is in.

3 Q. So here, the '399 patent describes
4 reevaluating a vehicle location to determine if
5 the vehicle has entered a new segment; correct?

6 A. Correct.

7 Q. And when the '399 patent says that
8 current location is reevaluated to determine if
9 the vehicle has entered a new segment, that's
10 referring to a new historical segment; right?

11 MR. HERMAN: Objection; form.

12 THE WITNESS: Well, any existing route
13 will have its own segmentation, and on that route
14 you can look for segments of other routes that
15 might be similar to the current route and use it.
16 And this is saying you have to be continuously
17 evaluating what segment of a route you are in.

18 BY MR. CHOWDHURY:

19 Q. So when the '399 patent says that the
20 current location is reevaluated to determine if
21 the vehicle has entered a new segment, the
22 reference to the segment is identifying a new

1 historical segment; right?

2 MR. HERMAN: Objection; form.

3 THE WITNESS: No. Yeah, I actually
4 don't read it that way. It is a new segment and
5 that segment may or may not be historical.

6 BY MR. CHOWDHURY:

7 Q. In your opinion, does the description of
8 Figure 5 indicate that historical data is used to
9 determine a probable optimal speed?

10 A. I'm going to go back to 5.

11 (Witness peruses the exhibit.)

12 THE WITNESS: Okay. Restate your
13 question, please.

14 BY MR. CHOWDHURY:

15 Q. In Figure 5, is historical information
16 used to determine a probable optimal speed?

17 A. I want to refer to one other thing here.
18 I want to go back and see the definition of
19 Figure 5. So I'm just scanning over there real
20 quick.

21 Right. So Figure 5 -- I'm reading from
22 Column 6. Figure 5 shows steps that may be

1 followed for determining a probable optimum speed
2 based on historical route information. So it is
3 a -- it may be followed. It doesn't say it is
4 followed, but it may be followed.

5 Q. And does that historical route
6 information include a historical segment?

7 A. If it exists.

8 Q. So is it fair that Figure 5 describes a
9 method of determining a probable optimal speed
10 using a historical segment?

11 MR. HERMAN: Objection; form.

12 THE WITNESS: Yes.

13 BY MR. CHOWDHURY:

14 Q. In your opinion, does the Figure 5
15 description describe a system retrieving and
16 applying past speed and power data using an, A,
17 historical segment to optimize a current route
18 being taken by a vehicle?

19 MR. HERMAN: Objection; form.

20 THE WITNESS: I will restate the wording
21 of the patent, and Figure 5 shows steps that may
22 be followed for determining a probable optimal

1 speed based on historical route information.

2 BY MR. CHOWDHURY:

3 Q. And just so we're clear, that historical
4 route information includes a historical segment;
5 correct?

6 A. Includes, sorry, I missed it. Includes
7 historical?

8 Q. Segment.

9 A. Yes. Yes.

10 Q. Around line 42 of Column 18, the
11 '399 patent --

12 A. I've got to move back. Okay. What
13 line?

14 Q. Line 42 of Column 18.

15 A. Okay.

16 Q. Here, the patent says, If the answer is
17 "yes," then nothing needs to be done until the
18 next time the location is measured. If the answer
19 is "no," then the database is examined to find
20 historical information about this segment.

21 Did I read that correct?

22 A. Yes, referring to Figure 5, yes.

1 Q. So from this description, the
2 '399 patent says that a current location of the
3 vehicle indicates that the vehicle has entered a
4 new segment; correct?

5 A. If -- I'm not sure you said that right.
6 So please say it again.

7 Q. From this description, the '399 patent
8 says that the current location of the vehicle
9 indicates that the vehicle has entered a new
10 segment; correct?

11 A. I don't think you're saying that right.
12 What it's saying is when you enter a segment, then
13 you ask yourself the question: Are you in a
14 segment that has historical data, or are you not?
15 And every time you come into a new segment of your
16 current route, you repeat that query.

17 Q. And the determination that the vehicle
18 has entered a new segment, that's based on the
19 current location of the vehicle; correct?

20 A. The current location of the vehicle
21 dictates what segment you are in.

22 Q. And the new segment -- the

1 identification of a new segment can then be used
2 to determine a new historical segment; correct?

3 A. Yes, in that every time you enter a new
4 segment of your current route, you look to see if
5 that data from a previous route is available.

6 Q. Could you now turn to line 55 in the
7 same column, Column 18.

8 A. Column 18, 55.

9 Q. Here, the '399 patent says that the
10 process can iteratively repeat for the next
11 location measurement as the vehicle continues.

12 Do you see that?

13 A. The process -- yes, I see that.

14 Q. So the process that's being referred to
15 in this sentence, that's referring to the process
16 that we've just been talking about using location
17 measurements to identify historical segments;
18 correct?

19 A. Correct. It was what I was saying, is
20 that each time you enter a new segment, you
21 repeat, looking to see if there's an existing
22 segment -- existing data.

1 Q. So when the '399 patent says
2 "iteratively repeat," this means that each
3 historical segment is identified for a route as
4 the vehicle's location changes; correct?

5 MR. HERMAN: Objection; form.

6 THE WITNESS: What this is saying is
7 that when the system has -- is on a route and it's
8 breaking it up into segments, as it moves from one
9 segment to another segment of the current route,
10 it looks to see if there's past data. And it does
11 that iteratively or repeatedly for each time it
12 goes into a new segment.

13 BY MR. CHOWDHURY:

14 Q. And that process involves identifying a
15 historical segment corresponding to the new
16 segments; right?

17 A. Correct.

18 Q. Could you turn to line 57 of Column 18?

19 A. 57, yes.

20 Q. So here, the first sentence says,
21 Figure 5 describes a method of determining a
22 probable optimal speed using historical route

1 information.

2 Do you see that?

3 A. I do.

4 Q. And the next sentence says, In Figure 5,
5 the probable optimal speed is identified from the
6 historical route information as the most efficient
7 speed (for example, the speed having the lowest
8 energy requirement) used by the vehicle when
9 traversing the segment, when that segment is part
10 of a route having the same destination as the
11 current destination.

12 Do you see that?

13 A. I do see that.

14 Q. So based on this description, would you
15 agree with me that the probable optimal speed is
16 identified based on a historical segment?

17 A. It is based on previous calculations
18 that have been run for that segment. So, hence,
19 it is a historical value for that segment.

20 Q. And those historical values are
21 associated with the historical segment; correct?

22 A. Yes, historical calculations of power

1 for that segment.

2 Q. And those historical segments, they're
3 identified using a current location of the
4 vehicle; right?

5 MR. HERMAN: Objection; form.

6 THE WITNESS: Well, it also says here
7 that it recognizes that the destination for this
8 route is the same as a previous route. So it has
9 some sense of -- the system has some sense of
10 knowing where to look.

11 Right there, I mean, to me, the fact
12 that it says the current destination is the same
13 as the previous destination is an important part
14 of when this method might be applied.

15 BY MR. CHOWDHURY:

16 Q. And maintaining the probable optimal
17 speed -- strike that.

18 Allowing a vehicle to maintain the
19 probable optimal speed involves applying a
20 necessary power to maintain that speed; right?

21 MR. HERMAN: Objection; form.

22 THE WITNESS: Yeah, depending on the

1 segment of road, there will be a different power
2 to maintain a particular speed.

3 BY MR. CHOWDHURY:

4 Q. And as we've previously discussed, a
5 probable optimal speed is a type of power
6 application described in the '399 patent; correct?

7 MR. HERMAN: Objection; form.

8 THE WITNESS: Restate, because I missed
9 something.

10 BY MR. CHOWDHURY:

11 Q. Running a vehicle at a probable optimal
12 speed is a type of power application technique
13 described in the '399 patent; right?

14 MR. HERMAN: Objection; form.

15 THE WITNESS: The problem is the power
16 calculation comes first for the speed. So
17 specifying power and specifying speed are not
18 necessarily the same thing. The power leads to
19 the speed that you can travel.

20 BY MR. CHOWDHURY:

21 Q. Does allowing a vehicle to maintain a
22 probable optimal speed involve applying a

1 necessary power?

2 A. Yes, power is required to achieve a
3 vehicle speed.

4 Q. So let's now turn back to your
5 declaration. Just let me know when you have that
6 document open.

7 A. We -- yeah, sure.

8 Q. Okay. So if you could turn to
9 paragraph 90 of your declaration. Just let me
10 know when you're there.

11 A. Yes, I'm here.

12 Q. In this paragraph, you state, these --
13 these claim elements clearly necessitate -- strike
14 that.

15 So in paragraph 90, you say, "To start,
16 these claim elements clearly necessitate that the
17 'route' being traveled by the vehicle is known."

18 Do you see that?

19 A. Yes.

20 Q. And then you say --

21 A. I see that.

22 Q. -- "This in turn requires that the

1 vehicle's destination be known to plan (or
2 recognize) the route."

3 Did I read that right?

4 A. You read it right.

5 Q. In your opinion, does the '399 patent
6 define the word "route"?

7 A. I think it does. Because it talks about
8 a starting destination and an ending destination.

9 Q. Could you point me to --

10 A. It doesn't describe how things are
11 connected, but it does say the route connects the
12 starting point to the ending point.

13 Q. And in your opinion, that's a definition
14 of the route that's described in the '399 patent
15 specification?

16 A. Yes.

17 MR. HERMAN: Objection; form.

18 BY MR. CHOWDHURY:

19 Q. Okay. So let's turn to the '399 patent,
20 which is Exhibit 1001. And just let me know when
21 you have that document open.

22 A. Okay.

1 Q. Could you please turn to Column 27,
2 starting at around line 43.

3 A. Hang on. What was that, again, what
4 column?

5 Q. Column 27, line 43, which is essentially
6 Claim 1 of the '399 patent.

7 A. Okay. Claim 1. Okay.

8 Q. In your opinion, where in Claim 1 do you
9 see a requirement to determine a destination?

10 A. I think it's a plain use of the term
11 "route." I don't think you can have a route
12 without having a destination. Otherwise, you're
13 just randomly driving.

14 Q. And that's because the '399 patent
15 defines the term "route" as having a destination;
16 correct?

17 MR. HERMAN: Objection; form.

18 THE WITNESS: Yes, the patent says you
19 start with determining a destination.

20 BY MR. CHOWDHURY:

21 Q. So a destination is a defining element
22 of a route?

1 A. It is one feature of the route, but it's
2 a fairly key feature of the route. It's the end
3 point of the route.

4 Q. And to be clear, Claim 1 doesn't use the
5 term "destination"; correct?

6 A. The word "destination" does not appear
7 in Claim 1.

8 Q. And the word "destination" is instead
9 used in dependent Claim 4; correct?

10 A. It is -- the word is used in 4 as one of
11 the methods of determining what the destination
12 is.

13 Q. And what is your understanding of the
14 requirements of Claim 4?

15 A. The specifications say that the process
16 starts with a destination being entered in the
17 system. It could either be entered explicitly,
18 and if that's not the case, then the method allows
19 for -- the system allows for a method of inferring
20 what the destination is based on previous --
21 previous trips.

22 Q. And Claim 4 uses the phrase, "further

1 comprises."

2 Do you see that?

3 A. "Further comprising," yes, I see that.

4 Q. So how do you understand the
5 requirements of Claim 4 in relation to the steps
6 recited in Claim 1?

7 A. Okay. So I'm not a lawyer, and I know
8 that some of these phrases have clear legal
9 meaning, but the way that I interpret this is that
10 one of the possible steps in this system is to use
11 statistical logic to determine the destination.

12 Q. So the step of selecting a destination
13 that's recited in Claim 4 is an additional step to
14 the steps recited in Claim 1; fair?

15 MR. HERMAN: Objection; form.

16 THE WITNESS: Okay. So 4 is a dependent
17 claim. And so we already have the system in
18 place, and now we're describing an additional
19 feature that the system might have.

20 BY MR. CHOWDHURY:

21 Q. And turning back to Claim 1, the first
22 step, which is around line 44, that step says,

1 "determining a segment of a vehicle route."

2 Do you see that?

3 A. Yes, I see that.

4 Q. Do you see any language in the claim
5 indicating that the segment information includes
6 positions actually traveled by a vehicle?

7 A. I can't conceive of how you would
8 construe it any other way. The segments only make
9 sense if they get you on the route to the
10 destination.

11 Q. So in your opinion, when Claim 1 recites
12 to "segment," it requires actually traveled
13 vehicle data?

14 MR. HERMAN: Objection; form.

15 THE WITNESS: I'm not sure you said that
16 right. It -- please say that again.

17 BY MR. CHOWDHURY:

18 Q. So in your opinion, does the segment
19 that's recited in Claim 1 require information
20 regarding positions actually traveled by the
21 vehicle?

22 MR. HERMAN: Objection; form.

1 THE WITNESS: I believe that the
2 segments have to be on the route that takes you to
3 the destination, and they would be used to get you
4 to the destination.

5 BY MR. CHOWDHURY:

6 Q. Let's turn to paragraph 55 of your
7 declaration. And just let me know when you're
8 there.

9 A. I'm there.

10 Q. In this paragraph you state, "The use of
11 future location information in the determination
12 of the applied power is an essential element of
13 the '399 patent."

14 Did I read that correctly?

15 A. You read it correctly.

16 Q. So is it your opinion that all power
17 optimization techniques in the '399 patent require
18 use of future location information?

19 A. Yes.

20 Q. And in paragraph 55, you also state, "In
21 the patent, upcoming driving conditions are used
22 by the power management system to determine the

1 applied power/speed."

2 Do you see that?

3 A. I see that.

4 Q. And then you cite to Column 3, line 55,
5 to Column 4, line 10 of the '399 patent
6 afterwards; is that right?

7 A. That is correct.

8 Q. So just to confirm, your opinion is that
9 each of the power application techniques described
10 in the cited portion of the '399 patent in
11 paragraph 55, requires use of future location
12 information; correct?

13 A. Future -- you consider all segments of
14 the route, which are things you haven't driven on
15 yet. So, yes, they are future segments of the
16 route.

17 Q. So let's turn back to the '399 patent.
18 And just let me know when you're there.

19 A. Okay.

20 Q. Could you go to Column 7, starting
21 around line 32?

22 A. Sure. Okay.

1 Q. So in this portion, the '399 patent
2 says, "In general, there are many ways to optimize
3 energy efficiency, as described in more detail
4 below. As will be described, any of the methods,
5 devices and system described herein may be used
6 together, individually, or in different
7 combinations."

8 Did I read that correctly?

9 A. You read it correct.

10 Q. So does this description refer to the
11 invention as a whole that's described in the
12 '399 patent?

13 MR. HERMAN: Objection; form.

14 THE WITNESS: I think that's a general
15 statement prepping for what follows, yes.

16 BY MR. CHOWDHURY:

17 Q. So this description is applicable to the
18 various examples of techniques described in the
19 '399 patent; fair?

20 A. Yes.

21 Q. And in this description, you don't see a
22 reference to future location information; do you?

1 A. It says there are many ways to do this,
2 and it does not, in this paragraph, list all the
3 ways to do it. So that's just an introductory
4 paragraph. The word "future" is not in that, but
5 a lot of other things are not in that statement
6 either.

7 Q. Let's now go back to your declaration,
8 paragraph 178 of your declaration. And just let
9 me know when you're there.

10 A. I'm there.

11 Q. So in this paragraph you state, In my
12 opinion, the claims require prospective
13 speed/power calculations: calculations must be
14 performed for upcoming, but not yet reached route
15 segments to allow the vehicle to subsequently
16 travel over the segment at the calculated speed
17 using the calculated power.

18 A. You read it correctly. Sorry.

19 Q. So your opinion is that the segment
20 that's recited in Claim 1 are not yet reached
21 route segments; correct?

22 A. I'm going to go back to Claim 1.

1 And your question again is, please?

2 Q. Your opinion is that the segment recited
3 in Claim 1 is a not yet reached route segment;
4 correct?

5 A. Yes, it is a -- again, repeat your
6 question so I'm answering precisely.

7 Q. Sure, not a problem.

8 Your opinion is that the segment recited
9 in Claim 1 is a not yet reached route segment;
10 correct?

11 A. Correct.

12 Q. And in your view, the segment can only
13 be a not yet reached route segment; right?

14 A. Say that again. And can only be?

15 Q. Can only be -- in your view, the segment
16 can only be a not yet reached route segment;
17 correct?

18 A. I wouldn't put that restriction on it.
19 It would be all of the segments on the route.

20 Q. Does the '399 patent define the term
21 "segment"?

22 MR. HERMAN: Objection; form.

1 THE WITNESS: It gives examples of how
2 one might segment. There are many different ways
3 in which segments could be -- a road -- there are
4 many different ways in which a route could be
5 segmented and the patent describes some of those
6 methods.

7 BY MR. CHOWDHURY:

8 Q. So you would agree with me that the
9 '399 patent does not define the term "segment";
10 correct?

11 MR. HERMAN: Objection; form.

12 THE WITNESS: I -- the '399 describes
13 methods and it provides an example of how the
14 segments might be calculated and it describes
15 considerations that might be made in order to
16 define a segment. I don't think there is a
17 definition provided, but I think it's clear by
18 implication what they're talking about. It is a
19 segment of a route.

20 BY MR. CHOWDHURY:

21 Q. And thank you for that explanation. I
22 appreciate it.

1 Could we turn now to Column 14 of the
2 '399 patent? Just let me know when you're there.

3 A. Column 14?

4 Q. Yes, that's right. And we will --
5 starting around line 17.

6 A. Yes. Okay.

7 Q. So here the '399 patent says, The route
8 may be segmented in any appropriate manner. For
9 example, the route may be broken into segments
10 based on predetermined or anticipated changes in
11 speed (for example, switching from 65 to 55 miles
12 per hour) changing traffic partners (for example,
13 turns, stops, yields, et cetera), traffic or
14 anticipated traffic, distance (for example,
15 x miles), terrain (for example, the gradient or
16 condition of a road), or the like. And in some
17 variations, the route may be segmented based on a
18 combination of such factors.

19 Did I read that correctly?

20 A. You read it correctly.

21 Q. Does a segment representing a change in
22 traffic pattern, is that tied to a present

1 position of a vehicle?

2 MR. HERMAN: Objection; form.

3 THE WITNESS: That does not depend on
4 the present location of a vehicle. It would be
5 any of the locations along the route would be
6 evaluated and segmented according to some of the
7 suggestions here.

8 BY MR. CHOWDHURY:

9 Q. So in -- around line 21, do you see a
10 reference to "traffic or anticipated traffic"?

11 Do you see that?

12 A. Changing traffic patterns, is that --

13 Q. And then right after that it says,
14 traffic --

15 A. "Traffic or anticipated traffic,"
16 correct.

17 Q. What's the difference between "traffic"
18 and "anticipated traffic"?

19 A. I could imagine a scenario that you're
20 on a route and it might be in the middle of rush
21 hour and that changes on the route. Maybe you
22 start at 4 o'clock and you're still on the road at

1 5 o'clock and it's anticipated that the traffic
2 pattern will go up at 5 o'clock.

3 There's other ways to interpret that as
4 well, but that's just one way of anticipating --
5 that's one way I might interpret anticipated
6 traffic.

7 Q. In your opinion, is it conceivable that
8 a segment is determined based on a current
9 position of a vehicle?

10 MR. HERMAN: Objection; form.

11 THE WITNESS: I think the segmenting is
12 independent of the current location of the
13 vehicle. Other than -- other than the current --
14 the current location of the vehicle is indicative
15 of the route.

16 BY MR. CHOWDHURY:

17 Q. Could we now go to the Column 14 of the
18 '399 patent. I think we're already there.

19 A. Yeah, we're already there, yeah.

20 Q. Let's go to line 31. Just let me know
21 when you're close to line 31.

22 A. I'm there.

1 Q. Great.

2 A. Yep.

3 Q. So near the right of line 31, the
4 '399 patent says, The route may be continuously
5 re-segmented. For example, as the vehicle moves,
6 the power management device may become aware of
7 changing road conditions (for example, traffic,
8 weather), or the user may change the route,
9 necessitating re-segmenting.

10 Did I read that right?

11 A. You read it correctly.

12 Q. And the following sentence says, "As
13 used herein, 'continuously' may mean repeated
14 multiple times, including repeating regularly or
15 periodically."

16 Do you see that?

17 A. Yes.

18 Q. In your opinion, are segments that are
19 gen- -- are -- strike that.

20 In your opinion, are segments that are
21 generated as the vehicle moves examples of not yet
22 traveled segments?

1 A. Yes, I interpret it that it's looking
2 along the route, making segments along the route
3 that the vehicle plans to travel.

4 Q. And would you agree with me that
5 segments that are generated as the vehicle moves
6 are examples of current segments?

7 MR. HERMAN: Objection; form.

8 THE WITNESS: There are multiple
9 segments on the route, and I would define
10 "current" as being the segment of the route that
11 the vehicle currently occupies.

12 BY MR. CHOWDHURY:

13 Q. So segment that is determined based on a
14 current location of a vehicle, is that a current
15 segment?

16 A. If your location is within a segment of
17 the route that you've defined, then yes.

18 Q. And you would agree with me that the
19 '399 patent discloses power optimization
20 techniques using a segment that includes a
21 vehicle's current position; correct?

22 A. The method uses all the positions,

1 including the current position.

2 Q. So let's turn to Column 5 of the
3 '399 patent specification. Just let me know when
4 you're there. We'll go to around line 38.

5 A. Column 5, 38. One second. Yeah,
6 Column 5, 38.

7 Q. So in this portion, the '399 patent
8 says, and I'll read from the patent, The applied
9 power may be calculated continuously. For
10 example, the applied power may be calculated at
11 each point (for example, every segment, or points
12 within a segment) as the vehicle is being driven.
13 Thus, over an entire route, the most energy
14 efficient speed at which to drive may be
15 continuously calculated.

16 Did I read that correctly?

17 A. You read it correctly.

18 Q. In your opinion, does the description --
19 does this description of the '399 patent teach
20 calculating applied power for a current segment as
21 the vehicle is driven?

22 A. I'm not saying -- you are calculating

1 power for all the segments between your current
2 location and your destination, and you are -- here
3 it's saying it's continuously being updated as you
4 drive. So in the current segment, you are -- what
5 was your question, again, so I answer it?

6 Q. You would agree with me that the
7 '399 patent discloses power optimization
8 techniques using a segment that includes the
9 vehicle's current location; correct?

10 A. The vehicle's current location is one of
11 many calculations that are being evaluated
12 continuously.

13 Q. And so one way you could optimize for
14 power is by using a segment that includes the
15 vehicle's current location; right?

16 MR. HERMAN: Objection; form.

17 THE WITNESS: Again, the calculation
18 only makes sense in the total of all the other
19 subsequent segments. So you do a --

20 BY MR. CHOWDHURY:

21 Q. So --

22 A. Sorry.

1 Q. Sorry for interrupting. You can go
2 ahead.

3 A. What you do in one segment is affected
4 by what you do in the next segment.

5 Q. If you could turn to line 49 of the same
6 column.

7 Here, the '399 patent says, Energy
8 efficient speeds for current and upcoming route
9 segments can then be calculated.

10 So, in your opinion, does this
11 description say that an energy efficient speed can
12 be calculated for a current route segment?

13 A. And, again, this says pretty clearly
14 it's the current and upcoming route segment. So,
15 yes, the current is part of the calculation. But
16 all the other segments are part of the
17 calculation.

18 Q. And is it your understanding that a
19 calculated energy efficient speed can be related
20 to an applied power?

21 MR. HERMAN: Objection; form.

22 THE WITNESS: Energy is the integration

1 of the power. So, yes, the power leads to the
2 energy.

3 MR. CHOWDHURY: Great. And so we've
4 been going on for about an hour. We can take a
5 ten-minute break, if that works for you, Dr. Hoff.

6 THE WITNESS: I could use a ten-minute
7 break. The coffee has been working its way
8 through. So -- as I'm sure I'm not the only
9 coffee drinker.

10 (Recess from the record.)

11 MR. CHOWDHURY: Let's get back on the
12 record.

13 BY MR. CHOWDHURY:

14 Q. Dr. Hoff, maintaining an energy
15 efficient speed for a vehicle involves applying a
16 power to the vehicle; correct?

17 A. Yes. It's part of it. It may or may
18 not be energy efficient. You've got to do a
19 calculation to figure that part out.

20 Q. Let's now turn back to your declaration.
21 Paragraph 108. And let me know when you're there.

22 A. Okay. I'm there.

1 Q. So here you state, "Hongo teaches an
2 'adaptive cruise control system that automatically
3 controls the speed of a vehicle.'"

4 Do you see that?

5 A. I do.

6 Q. And in the next sentence, you state,
7 "The system uses the 'current position of the
8 vehicle' and 'real-time road environment
9 information related to weather and sunlight
10 conditions' to make cruise control speed
11 decisions."

12 Did I read that correctly?

13 A. You did.

14 Q. So your opinion is that the current
15 position of the vehicle is used to provide cruise
16 control functionality described in Hongo; correct?

17 A. Correct.

18 Q. And you would agree with me that this
19 cruise control functionality is also provided
20 through use of historical information stored in
21 the database; yes?

22 A. Yes, Hongo uses historical information.

1 Q. And that's because in paragraph 109, you
2 state that the Hongo system not only collects
3 current vehicle position and condition
4 information, but also utilizes two databases;
5 right?

6 A. It does, yes.

7 Q. And those two databases include the
8 driving history DB10 and a driving block DB20;
9 right?

10 A. Correct, both are used.

11 Q. Let's now turn to Hongo, which is
12 Exhibit 1005 in this proceeding. And this exhibit
13 is a certified translation of Exhibit 1007, which
14 is the original Japanese publication version.
15 I'll refer to Exhibit 1005 as "Hongo" for today's
16 questioning. I hope that's okay?

17 A. It's good for me, yes.

18 Q. Excellent.

19 So when you have Hongo available and
20 open, could you please turn to paragraph 22 of
21 Hongo?

22 A. Okay. 22. I'm there.

1 Q. So around -- a couple of lines down,
2 following the second bracket that reads
3 "Embodiment," Hongo says, Figure 1 is a system
4 configuration diagram of a target vehicle speed
5 determining device 100 according to an embodiment
6 of the present invention.

7 Do you see that?

8 A. I see that.

9 Q. And that device 100 includes a GPS
10 device 170; correct?

11 A. Down at line 23 -- or paragraph 23, GPS
12 device 170, yes.

13 Q. And so let's now turn to paragraph 23.

14 The first line says, GPS device 170
15 provides current vehicle information -- current
16 vehicle position information sent from satellites.

17 Did I read that correctly?

18 A. You did.

19 Q. Does Hongo teach using GPS to identify a
20 current position of a vehicle?

21 A. It does.

22 Q. And that's shown in Figure 1, right,

1 with the -- the current position is shown in
2 Figure 1; correct?

3 A. Yeah, I'm going to go back to be sure,
4 but, yeah, Figure -- wait a second, that's in the
5 back, sorry. The figure is at the back.

6 Yeah, Figure 1 shows GPS as part of the
7 system.

8 Q. Let's go to paragraph 32. And just let
9 me know when you have that available to you.

10 A. Playback mode, yes, 32.

11 Q. So here Hongo says, "In the playback
12 mode, the block number BKN and the road
13 environment parameters Y are specified from the
14 current position coordinate r and the road
15 environment real-time information X by a method
16 equivalent to the above-mentioned driving history
17 recording means 140."

18 Do you see that?

19 A. Yes, I see that.

20 Q. So you would agree with me that the
21 current position coordinate r represents
22 information about the current position of the

1 vehicle; fair?

2 A. That is fair.

3 Q. And in the last sentence of
4 paragraph 32, Hongo describes, "However, instead
5 of using BKN, it is also possible to search
6 directly using r (coordinates) as a key."

7 Do you see that?

8 A. I see that.

9 Q. So, in your opinion, does Hongo teach
10 using current position coordinate r to search
11 driving history DB10?

12 A. I'm just going to go back to the figure.
13 So, yeah, r is used as part of the
14 driving history recording means.

15 Q. So Hongo teaches --

16 A. And the driving history search means,
17 right, okay.

18 Q. So just to confirm, Hongo teaches using
19 current coordinate -- current position coordinate
20 r to search driving history DB10; correct?

21 A. Yes.

22 Q. And that current position coordinate r

1 is determined using GPS; right?

2 A. It is from GPS, right.

3 Q. So based on Hongo's description, a
4 current vehicle position that is determined based
5 on GPS is used to search driving history DB10;
6 correct?

7 A. Correct.

8 Q. And that driving history DB stores
9 historical block information; right?

10 A. Correct.

11 Q. So you would agree with me that the
12 current vehicle position determined using GPS is
13 used to determine historical block information;
14 correct?

15 A. Yes, the GPS position is being used to
16 query historical data in the database.

17 Q. So let's now turn to paragraph 33 of
18 Hongo. And just let me know when you're there.

19 A. Okay. 33.

20 Q. In this paragraph, Hongo states, If
21 there is -- If there are driving history data 11
22 in which both keys (BKN and Y) match, the average

1 value u can then be used as the target vehicle
2 speed.

3 Do you see that?

4 A. I do.

5 Q. So is it fair to say that in these
6 circumstances, the current position of the vehicle
7 is used to identify relevant parts of driving
8 history data 11?

9 A. The current position is used to
10 determine the relevant history data, yes.

11 Q. So you would agree with me that the --
12 in Hongo, the current position of the vehicle is
13 used to determine a target vehicle's speed;
14 correct?

15 A. Correct.

16 MR. CHOWDHURY: I have no further
17 questions.

18 MR. HERMAN: I don't have anything
either. So I think with that, we're probably
19 done, Dr. Hoff. I just want to thank you for your
20 time.

21 THE WITNESS: Okay. Great.

22 (Off the record at 11:29 a.m.)

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15 IN WITNESS WHEREOF, I have hereunto set
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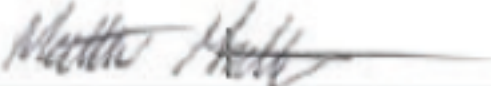
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MATTHEW GOLDSTEIN, RMR, CRK

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2 ORRICK HERRINGTON & SUTCLIFFE, LLP
3 51 West 52nd Street
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5

6 Case: Tesla, Inc. v. iQar Inc.
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