

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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TESLA, INC.,

Petitioner,

v.

iQAR INC.,

Patent Owner

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Case IPR2024-00545  
U.S. Patent No. 8,972,161

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**PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE**

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**LIST OF EXHIBITS**

|            |                                                                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TESLA-1001 | U.S. Patent No. 8,972,161 (“the ’161 Patent”)                                                                                                                                                          |
| TESLA-1002 | Excerpts from the Prosecution History of the ’161 Patent                                                                                                                                               |
| TESLA-1003 | Declaration of Dr. Papanikolopoulos, Ph.D.                                                                                                                                                             |
| TESLA-1004 | Curriculum Vitae of Dr. Papanikolopoulos, Ph.D.                                                                                                                                                        |
| TESLA-1005 | U.S. Publication No. 2004/0068359 (“Neiss”)                                                                                                                                                            |
| TESLA-1006 | U.S. Patent No. 6,161,072 (“Clapper”)                                                                                                                                                                  |
| TESLA-1007 | W. C. Morchin, “Energy management in hybrid electric vehicles,” 17th DASC. AIAA/IEEE/SAE. Digital Avionics Systems Conference. Proceedings, Bellevue, WA, USA, 1998, pp. I41/1-I41/6 vol.2 (“Morchin”) |
| TESLA-1008 | U.S. Patent No. 6,658,344 (“Hirasago”)                                                                                                                                                                 |
| TESLA-1009 | U.S. Patent No. 6,005,494 (“Schramm”)                                                                                                                                                                  |
| TESLA-1010 | Complaint, <i>iQar Inc. v. Tesla, Inc.</i> , 1:23-cv-00694, W.D. Tex., June 20, 2023                                                                                                                   |
| TESLA-1011 | U.S. Patent No. 6,836,719 (“Andersson”)                                                                                                                                                                |
| TESLA-1012 | U.S. Patent No. 5,584,208 (“Ha”)                                                                                                                                                                       |
| TESLA-1013 | U.S. Patent No. 5,129,475 (“Kawano”)                                                                                                                                                                   |
| TESLA-1014 | U.S. Patent No. 4,225,007 (“Voges”)                                                                                                                                                                    |
| TESLA-1015 | Excerpt from Random House Webster’s Unabridged Dictionary, Second Edition (2001)                                                                                                                       |
| TESLA-1016 | Excerpt from Collins English Dictionary Complete and Unabridged, Sixth Edition (2003)                                                                                                                  |

|                 |                                                                                                                                                                             |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TESLA-1017      | Excerpt from The New Oxford American Dictionary (2001)                                                                                                                      |
| TESLA-1018      | U.S. Patent No. 8,271,166 (“Wolf”)                                                                                                                                          |
| TESLA-1019      | Japanese Patent Pub. No. 11220807 (“Hosoda Original”)                                                                                                                       |
| TESLA-1020      | Certified Translation of Japanese Patent Pub. No. 11220807 (“Hosoda”)                                                                                                       |
| TESLA-1021      | U.S. Patent No. 6,314,347 (“Kuroda”)                                                                                                                                        |
| TESLA-1022      | U.S. Patent No. 7,013,205 (“Hafner”)                                                                                                                                        |
| TESLA-1023-1049 | RESERVED                                                                                                                                                                    |
| TESLA-1050      | Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”) |
| TESLA-1051      | Proof of Service of Complaint, <i>iQar Inc. v. Tesla, Inc.</i> , 1:23-cv-00694, W.D. Tex., June 23, 2023                                                                    |
| TESLA-1052      | Motion to Transfer Venue                                                                                                                                                    |
| TESLA-1053      | Deposition of Dr. Craig Hoff (February 6, 2025)                                                                                                                             |
| TESLA-1054      | Excerpt from The New Oxford American Dictionary, Second Ed. (2005)                                                                                                          |

## I. INTRODUCTION

The Petition challenged claims of the '161 Patent as being obvious in view of two grounds: one based on Neiss and another based on the combination of Schramm and Clapper (Schramm-Clapper). For both grounds, iQar's Patent Owner Response ("POR") presents rebuttals that are factually and legally flawed because they (1) are based on overly-narrow interpretations of the claims and (2) fail to contend with and are refuted by the obviousness analyses as presented and the teachings of the underlying references.

With respect to the Neiss ground, iQar's arguments are limited to the trivial limitation of "receiving a route" ([1b]/[10b]). The Petition demonstrated that Neiss teaches or renders obvious this limitation under its plain and ordinary meaning given that Neiss's system would receive either a Prediction Horizon (*i.e.*, a path between the vehicle's current position and another position a predetermined distance ahead of the vehicle) or an end-to-end path. Pet., 14-18. In rebuttal, iQar alleges that this limitation should be interpreted such that (1) the "route" must include a destination and (2) the "receiving a route" step must occur before the claimed "segmenting said route." These narrow interpretations, however, are refuted by the express language of the claims, the teachings in the specification, and even extrinsic evidence that iQar itself proffers. Nothing in the record requires that the claimed "route" ***must*** include a destination nor imposes any particular

sequence of operations.

Even if the “receiving a route” limitation was narrowly interpreted in the manner iQar proposes, the Petition additionally demonstrated that Neiss in fact teaches or renders obvious receiving a route that includes a final destination and further teaches segmenting the route after the route has been received. iQar’s challenges fail to contend with this additional analysis as presented in the Petition and Neiss’s teachings underpinning such analysis.

With respect to the Schramm-Clapper ground, iQar’s rebuttal focused on identifying purported deficiencies in each reference individually, alleging that Schramm’s system does not contemplate variations in speed and Clapper’s system considers speeds that may not be efficient speeds. POR, 31-33. iQar’s analysis, however, fails to consider or address (1) the *collective* teachings of Schramm and Clapper—namely, Schramm’s route optimization process and Clapper’s teachings that vehicle speed may vary along a route—and (2) how these *teachings materialize in combination* to render obvious a route optimization approach that accounts for different per-segment energy values based on variations in speed along a route. Pet., 59-63.

For these reasons, and as discussed in more detail *infra*, iQar’s arguments in its POR should be rejected.

## II. CLAIM CONSTRUCTION

### A. “route” (claims 1 and 10)

The independent claims require, *inter alia*, “receiving a route” and “segmenting said route.” Both parties agree that the term “route” should be afforded its plain and ordinary meaning. *See* Pet., 14; POR, 18. The Petition explained that this encompasses “a path traveled by the vehicle.” *See* Pet., 2, 14. Consistent with this meaning, iQar’s expert, Dr. Hoff, cited a dictionary definition of “route” in testifying that the plain and ordinary meaning of “route” is “a road, path, or course from one place to another.” POR, 18; EX2003, ¶¶126-128 (citing EX2001). A place is simply a “particular position or point in space.” TESLA-1054, 3. Thus, the plain and ordinary meaning of “route” is a path from one point/position to another point/position.

iQar nevertheless attempts to narrow the term “route” to be not just a path between two points/positions (as its own expert confirms), but a path “*from [the vehicle’s] present location to its destination.*” POR, 18.

Nothing in the claim demands that a route must include a destination. Claims 1 and 10 simply recite a “route” without imposing any limitation on what the route must include. Indeed, it is telling that the patentee chose to expressly recite a “destination” elsewhere in the claims (*see* “segment destination” (claim 1) and “final destination” (claim 2)) yet did not do so in the context of the term

“route.”

The '161 Patent specification reinforces that a “route” need not include a destination, teaching that a route “typically includes a starting position ..., an ending position, ..., and any intermediate position between the initial and the final positions.” TESLA-1001, 13:40-44; *see id.*, 6:55-56, FIG. 1B (depicting a route between two “point[s],” point A and point B); TESLA-1053, 12:12-13:5 (“Q. So is this figure [FIG. 1B of the '161 Patent] conveying, then, a route between two points, point A and point B? A. Yes, it’s showing a simple example of a route between two points.”); POR, 19 (acknowledging that FIG. 1B shows a route extending from point A to point B). The portions of the '161 specification that iQar cites to support its position—that a route includes a destination—are merely non-limiting “example” teachings or embodiments. *See* POR, 18-20 (citing TESLA-1001, 6:55-56, 11:13-17, 11:31-32, 14:20-22). At best then, the specification contemplates that a “route” *can* include a destination.

Unsurprisingly, iQar does not allege any disclaimer or disavowal in the '161 specification or prosecution history requiring that a “route” must include a destination. *See Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (“To act as its own lexicographer, a patentee must ‘clearly set forth a definition of the disputed claim term’ other than its plain and ordinary meaning.”); *Hill-Rom Services, Inc. v. Stryker Corp.*, 755 F. 3d 1367, 1371.

In summary, in view of the intrinsic and extrinsic record, the term “route” should be given its plain and ordinary meaning, which encompasses a road/path from one point/position to another point/position. Nothing in the record supports iQar’s attempt to limit the term “route” to include a destination.

**B. Claims do not require an ordered sequence whereby a route is received before it is segmented**

iQar also contends that the independent claims “require an ordered, two-step process” under which a “‘route’ must first be ‘receiv[ed] ... at a computer of said vehicle” and “[t]hen, this already received route must be ‘segment[ed] ... into a plurality of segment destinations.’” POR, 12. The plain language of the claims does not require that the route be received before it is segmented, and iQar’s attempt to impose a temporal restriction on the claim scope is unjustified.

The independent claims include one limitation reciting that the route is received “at a computer of said vehicle” and another limitation reciting “segmenting said route.” Thus, while the claims recite that the same route that is received is also segmented, they do not impose any temporal constraint that the route must be segmented *only after* it is received—as iQar argues. *See* POR, 12-15. Said differently, the claims would be satisfied even if a route was segmented first and then the “computer of said vehicle” received the already-segmented route.

iQar nevertheless asserts that “[a] route cannot be segmented if it is not first ‘received’ by the vehicle computer performing the segmenting.” POR, 13. This argument thus rests on the premise—as confirmed by Dr. Hoff—that the “segmenting” must also be performed by the claimed computer, despite the claims not including such a limitation. *See* TESLA-1053, 19:20-20:15 (“Q: Must a segmenting of the route also be done by the vehicle’s computer? A. Yes. That is as described in the specifications. Q. Right. I’m talking about the claims, sir. So is it your view that the claim requires that the segmenting of the route be done by the computer of the vehicle? A. That is not written into the claim.”). That premise is flawed. The claims only recite that the “receiving” happens “at a computer of said vehicle.” They do not state that the same computer must also perform the claimed segmenting.

Thus, because the claims do **not** specify that that same vehicle computer must perform both the receiving and the segmenting, they therefore impose no requirement that the segmenting necessarily must be performed after receipt of the route. TESLA-1001, claim 1. That is, the plain language of the claims does not require an ordering of steps, nor is there an ordering requirement implicit in the claims, and thus iQar’s reliance on *Information Techs* (POR, 12) is inapposite.

The claims thus should not be read as demanding that the “segmenting” step must be performed only after the “receiving” step. *See Interactive Gift Exp., Inc. v.*

*Compuserve Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (finding that the claims did not require an ordered sequence based at least on the reasoning that “[u]nless the steps of a method actually recite an order, the steps are not ordinarily construed to require one”); *Loral Fairchild Corp. v. Sony Corp.*, 181 F.3d 1313, 1322, 50 USPQ2d 1865, 1870 (Fed.Cir.1999) ( “not every process claim is limited to the performance of its steps in the order written”).

### **III. NEISS RENDERS OBVIOUS THE INDEPENDENT CLAIMS OF THE '161 PATENT**

The Petition demonstrated obviousness of the '161 Patent's independent claims at least in view of Neiss. iQar's rebuttal to the Neiss ground is limited to the “receiving a route” limitation. In particular, iQar argues that Neiss does not teach or render obvious a “route” and even if it does, Neiss does not teach or suggest that the claimed “receiving” the route step occurs prior to the segmenting the route. POR, 12.

As the Petition explained, Neiss teaches or renders obvious that its vehicle's computer receives (1) a Prediction Horizon (which is a path from a current vehicle position to a position a predetermined distance ahead of the vehicle) (Pet., 14; TESLA-1005, [0015]) or (2) a path from the current vehicle position to the vehicle's final destination—both of which constitute a “route” under the plain and ordinary meaning of that term (Pet., 14; TESLA-1005, Abstract, [0001], [0015]).

Additionally, Neiss teaches the “receiving” and “segmenting” steps regardless of whether the claims are interpreted to require that these steps be performed in a particular sequence.

As explained *infra*, the rebuttals advanced by iQar in its POR lack merit and should be rejected because they are premised on overly narrow claim interpretations, and stem from mischaracterizations of Neiss’s disclosures and the specific theories advanced in the Petition

**A. Neiss’s Prediction Horizon is the Claimed “Route” Under the Plain and Ordinary Meaning of This Term**

The Petition identified Neiss’s Prediction Horizon as corresponding to the claimed “route.” *See* Pet., 14. Neiss’s Prediction Horizon is “a predetermined distance along the route” ahead of the vehicle’s “current position.” TESLA-1005, [0015], [0047], [0162]. Applying the plain and ordinary meaning of the term “route” (*see* §II.A, *supra*), Neiss’s Prediction Horizon is a route at least because it is a path between two places, *i.e.*, between the vehicle’s current position (one place) to a position that is a predetermined distance ahead of the vehicle (another place). *See* TESLA-1053, 12:4-6 (“Q. You’ll agree that a route can be a road or a path from one place to another; right? A. Correct.”).

Although the Prediction Horizon is plainly a route, particularly in view of the evidence that iQar itself proffers (POR, 18; EX2001, 1189), iQar nevertheless

maintains that the Prediction Horizon is not a route. According to iQar, that's because (1) the claimed "route" must be the "***path*** the vehicle is following to travel ***from its present location to its destination***," while (2) Neiss's Prediction Horizon is just the "terrain/road immediately in front of, and visible<sup>1</sup> from, the vehicle's current location" and "bears no relation to the vehicle's destination" or "route." POR, 18, 22 (emphasis in original); *see id.* (alleging that "Neiss's system is not aware of and does not determine the vehicle's destination").

These arguments fail in multiple respects.

***First***, as discussed *supra* §II.A, the intrinsic and extrinsic record refutes iQar's narrow interpretation requiring that the claimed "route" must include a destination. A route is simply a path between two points/positions, and Neiss's Prediction Horizon is unequivocally that.

***Second***, even assuming *arguendo* that a route must include a destination (which Petitioner does not concede), the '161 Patent confirms—and iQar acknowledges—that this destination need not be a final destination, but instead can

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<sup>1</sup> Nowhere does Neiss state that the Prediction Horizon must be "visible from" the vehicle's current location, as iQar asserts.

be just an intermediate destination. *See* TESLA-1001, 14:20-22; POR, 18.<sup>2</sup> Thus, assuming *arguendo* that a route must include a destination, the route can be simply a path from a vehicle's current position to an intermediate position along the way to a final destination. *See* TESLA-1001, 12:15-20 (explaining that a destination can be the "work" location of the driver or can be merely a point on the road, such as a "highway onramp").

Similarly, Neiss's Prediction Horizon is a path from the vehicle's current position to an intermediate position that is a predetermined distance ahead of the vehicle, along the path to the vehicle's final destination. *See* TESLA-1005, [0015], claim 1. As such, Neiss's Prediction Horizon is a route, even under iQar's narrow interpretation of the term.

***Third***, it is also incorrect for iQar to argue that "there is no correlation between the 'Prediction Horizon' and the route the vehicle is actually traveling."

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<sup>2</sup> To the extent the POR is arguing that a route must be interpreted to require a "known destination," that assertion is refuted by the '161 specification, which teaches that a route can be predetermined or non-predetermined. *See* TESLA-1001, 2:36-37. In other words, even if a route must include a destination, as iQar contends, the specification teaches that such a destination may not necessarily be a known destination.

POR, 22-24. Neiss's Prediction Horizon is a path from the vehicle's current position to another position ahead of the vehicle. *See* TESLA-1005, [0015]. And importantly, Neiss specifies that this path is along the vehicle's overall route, thus confirming that there is, in fact, a relationship between the Prediction Horizon and the vehicle's overall route.<sup>3</sup> *See* TESLA-1005, claim 1 ("sensing ... parameters as the vehicle *travels a route* ...; and as the vehicle travels *said route*, iteratively calculating ... vehicle control parameters that minimize said vehicle operating cost function for a *predetermined distance along said route* ahead of said vehicle"); [0015] (defining the Prediction Horizon as "a predetermined distance *along the route* ahead of the vehicle").

Despite Neiss's express indication of a correlation between the Prediction Horizon and the vehicle's overall route, iQar maintains that the Prediction Horizon does not relate to the route because, according to iQar, "a vehicle may very well

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<sup>3</sup> In this vein, the express teachings of Neiss refute iQar's assertions that the Prediction Horizon "bears no relation to the vehicle's destination." POR, 22. That's both because the end of each Prediction Horizon is an intermediate destination along the way to the vehicle's final destination, and because Neiss describes the Prediction Horizon as it relates to the overall route of the vehicle's travel. *See* TESLA-1005, [0015], claim 1.

*not* traverse the terrain corresponding to the Prediction Horizon and may instead take another, different path.” POR, 23. To be sure, it is possible that sometimes, a vehicle might deviate from the overall route it initially set out to follow. But this does not preclude that in other instances, the vehicle would indeed continue to follow the original overall route, thus hewing to each successive Prediction Horizon as it travels along that overall route. And to the extent the vehicle may deviate from the route it originally set out to follow, the Prediction Horizons the vehicle traversed before the deviation nevertheless correspond to at least the initial portion of its original route.

Moreover, the ’161 Patent itself recognizes that the final destination may not be known at the outset of vehicle travel, and that the vehicle’s overall route may deviate from its originally planned route during travel. *See* TESLA-1001, 5:30-31 (“The route can be revised ... during operation”). Thus, regardless of whether an overall route to a final destination is originally known, and whether any deviation occurs from the originally planned route, the ’161 Patent teaches that the vehicle nevertheless receives and traverses a route. In the same vein, Neiss’s vehicle would traverse a route even if the vehicle deviates from the originally planned route, and the Prediction Horizons for which optimization calculations are ultimately performed would track the actually traveled path.

**B. Neiss Additionally Teaches or Renders Obvious a Route Encompassing a Path from the Vehicle's Current Position to the Final Destination**

The Petition also asserted that Neiss teaches or renders obvious receiving a “route” that includes a path extending from the vehicle’s current position to the vehicle’s final destination. The Petition offered two theories in this regard. First, the Petition explained that, as Neiss’s vehicle travels from one point to another, it traverses multiple Prediction Horizons, which are iteratively received as the vehicle drives along the route. Pet., 14-16. By the time the vehicle reaches its final destination, all Prediction Horizons spanning the entire, start-to-finish journey of the vehicle have been received, thus rendering obvious receipt of a route. *Id.* Second, the Petition explained that it would be obvious to modify Neiss such that the entire, start-to-destination route is received all at once, thus again satisfying the claimed requirement of “receiving a route.” See Pet., 16-17; ID, 15 (“We are also persuaded, on this preliminary record, that it would have been obvious to modify Neiss’s system to receive the entire route.”). Dr. Papanikolopoulos offered detailed explanations of the motivations driving this modification and reasons why a POSITA would have had a reasonable expectation of success in so modifying Neiss’s system. See TESLA-1003, ¶¶68-72. iQar does not engage with, much less address, this evidence.

Thus, even if an individual Prediction Horizon is determined not to be a route, as iQar contends, Neiss's vehicle unequivocally traverses an overall, start-to-finish route, such that the set of Prediction Horizons that constitute the route to the final destination will have been received (either all at once or iteratively). *See* Pet., 14-16. In this regard, Neiss's onboard computer would receive a route that includes a final destination, thereby satisfying the plain and ordinary meaning of the term "route" as well as iQar's narrow interpretation (requiring that the "route" includes a destination). *See* POR, 18.

Notwithstanding Neiss's express disclosures regarding the vehicle traversing a route (*see* TESLA-1005, claim 1, [0015]) and the Petition's explanation of how such a route composed of successive Prediction Horizons includes the final destination, iQar's maintains that Neiss's successive Prediction Horizons do not include the final destination. *See* POR, 22-23. Each of iQar's arguments in support of this assertion lacks merit for the following reasons.

***First***, iQar argues that "the vehicle would need to actually follow the terrain corresponding to the Prediction Horizon—instead of turning or deviating from that terrain—for the final Prediction Horizon to include the vehicle's destination."

POR, 25. Certainly, Neiss contemplates that that would happen in many instances, thus satisfying the "receiving a route" limitation. TESLA-1005, claim 1. As such, it is immaterial if Neiss's system also allows for the remote possibility that a

vehicle might change its path partway through its travel. But even if the vehicle did change its path to deviate from an originally planned route, the vehicle would still have previously received Prediction Horizons prior to the deviation, and would continue to receive Prediction Horizons after the deviation along its new path to its ultimate destination —*i.e.*, iteratively received a “route,” under iQar’s own interpretation of the term. *See* POR, 18; TESLA-1001, 5:30-31.

*Second*, iQar argues that “even if the vehicle did precisely follow the Prediction Horizon, the overall route would need to be an exact multiple of Neiss’s frame length for the end of the Prediction Horizon to correspond with the end of the route.” POR, 25-26. But this assertion ignores that Neiss’s system is designed for the vehicle to traverse a particular overall route, and for the iterative computations of vehicle control parameters to be performed for each Prediction Horizon along that overall route. *See* TESLA-1005, claim 1 (“sensing ... parameters as the vehicle ***travels a route*** ...; and as the vehicle travels ***said route***, iteratively calculating ... vehicle control parameters that minimize said vehicle operating cost function for a ***predetermined distance along said route*** ahead of said vehicle”). Consistent with this objective, it would be a mere implementation detail to set the length of the frames in the Prediction Horizon such that the endpoint of the last Prediction Horizon aligns with the final destination of the overall route. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421, 127 S. Ct.

1727, 1742, 167 L. Ed. 2d 705 (2007) (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

In this regard, iQar also leverages one illustrative example of Neiss—specifying that “one Prediction Horizon can be 4000 m (or 4 km) long and include 200 frames,” each 20 m long—to allege that “the final Prediction Horizon will end either before or after the vehicle’s destination.” POR, 25-26 (citing TESLA-1005, [0192]). But this argument ignores that some overall routes would have a length that is a multiple of the 20 m frame length, in which case the end of the last Prediction Horizon would indeed coincide with the final destination. Moreover, this example is illustrative, and Neiss provides no strict requirements on the size of either the Prediction Horizon or the frames. In practice, it would be a straightforward implementation detail to select a frame length such the length of the vehicle’s overall route is a multiple of that frame length (and/or the vehicle’s final destination coincides with the ending point of the final Prediction Horizon).

**Third**, iQar takes issue with the obviousness analysis to which the entire start-to-finish route would be received all at once. iQar characterizes this analysis in the Petition as advancing a modification to Neiss to “perform[] calculations in advance for an entire route.” POR, 26; *see* 28 (mischaracterizing the Petition’s proposed modification as having the result that “Neiss’s system would no longer

perform real time calculations”); TESLA-1053, 30:12-32:9. This is simply not the theory advanced in the Petition.

The Petition explained that it would be obvious to receive the entire, end-to-end route all at once. *See* Pet., 16-17 (“it would be obvious to modify Neiss so that its onboard computer *receives* the entire route at once, instead of receiving it iteratively” (emphasis added)). It did not contemplate computing the vehicle control parameters for the entire, end-to-end route all at once, as iQar contends. Instead, in this modified Neiss system, the calculations would still be performed iteratively for each successive Prediction Horizon as the vehicle traverses the entirety of the route, consistent with Neiss’s disclosure; the only change would be that the route is received all at once.

In this regard, the computational efficiency, as noted in the Petition, stems from the receipt of the entire route in advance, and not from the computation of vehicle control parameters in advance for the entire route, as iQar alleges. POR, 27. As Dr. Papanikolopoulos explained, receiving the entire route at once is “computationally efficient” because it avoids the usage of network/ computational resources that would otherwise be needed to iteratively receive successive Prediction Horizons “as the vehicle drives,” instead allowing these resources to be deployed for subsequent real-time calculations of vehicle control parameters. TESLA-1003, ¶70; *see* Pet., 17. iQar’s arguments miss the point and challenge a

theory of its own making, rather than contending with the obviousness analysis presented in the Petition.

**C. Neiss Renders Obvious the “Receiving” and “Segmenting” Limitations Regardless of Whether the Independent Claims Are Interpreted as Requiring an Ordered Process**

*1. iQar’s Characterization of Neiss As Segmenting a Route Prior to Receiving the Route Satisfies the Independent Claims, Which Do Not Require an Ordered Process*

iQar asserts that Neiss’s system first segments the Prediction Horizon into frames and *then* receives the route when it receives the road curvature and gradient information. POR, 12. Because the claims do not require an “ordered, two-step process” in which the “receiving” step occurs before the “segmenting” step (*see* §II.B *supra*), even iQar’s characterization of Neiss satisfies this claim. That said, iQar’s characterization is refuted by Neiss’s teachings (as explained *infra* §V.B), which confirm that the route is received and subsequently segmented (thus satisfying the claims under any interpretation of these claims).

*2. Even if the Claims Are Interpreted as Requiring an Ordered Process, Neiss Satisfies that Interpretation Because Neiss’s System Receives a Route before Segmenting It*

As explained in the Petition, Neiss’s Prediction Horizon is received and used to query a digital road map to retrieve road information (*e.g.*, road curvature and gradient) about each frame (*e.g.*, segment) of the Prediction Horizon. *See* Pet., 15-16; TESLA-1005, [0015], claim 1. This road information is stored in frames of a

ring buffer along with computed vehicle control parameters for the Prediction Horizon. As iQar's expert confirmed, "data for the prediction horizon is stored in a section of memory which is the ring buffer" and "as the vehicle drives the route, past sections of memory are replaced with new calculations for when the cycle repeats." TESLA-1053, 34:2-8.

In other words, the Prediction Horizon is simply the path from a current position to a position ahead of the vehicle, and this Prediction Horizon is separated into frames. TESLA-1005, [0170]. And the ring buffer is computer memory used to store data about the Prediction Horizon, as Dr. Hoff confirmed. TESLA-1005, [0162]; TESLA-1053, 34-2-8 ("the data for the prediction horizon is stored in a section of memory, which is the ring buffer"). Thus, the ring buffer is a portion of computer memory that corresponds to the length of the Prediction Horizon, with each frame of this Prediction Horizon similarly corresponding to a section within such memory. TESLA-1005, [0170].

Despite this clear distinction between the physical Prediction Horizon and the ring buffer corresponding to that Prediction Horizon, iQar argues that the Prediction Horizon is the same as a ring buffer, and that a route is not received until road data is included in the frames of the ring buffer. *See* POR, 17. This is flawed in multiple respects.

**First**, Neiss’s Prediction Horizon is not the same as the ring buffer. As explained above, the Prediction Horizon is a path from one place to another—*i.e.*, a route. *See* TESLA-1005, [0015]; TESLA-1053, 22:21-23:8. The ring buffer itself is not a physical path. It is instead simply memory used to store data about this path.

**Second**, road data about the Prediction Horizon is not tantamount to a route, as iQar appears to argue. A route, as discussed in §II.A, is a path from one place to another. Data about the path, such as gradient and curvature, are “parameters” of the route, not the route itself. *See, e.g.*, TESLA-1005, [0015] (“As the vehicle travels over a particular route for which ***route parameters, such as road gradient and curvature***, are stored in a road map ...”).

**Third**, PO is also incorrect that “[t]he ‘Prediction Horizon’ is nothing more than a ‘parameter’ that specifies size ... of this ring buffer.” POR, 15. To be sure, the ring buffer size relates to the Prediction Horizon. *See* TESLA-1015, [0171]. But the ring buffer is merely a digital construct that represents the physical Prediction Horizon. *See* TESLA-1015, [0015]; Pet., 13. That is, the Prediction Horizon is a ***distance along the road***, not a buffer size parameter. *See* Pet., 14 (“The Prediction Horizon (blue *supra*) corresponds to a route because it constitutes a path traveled by the vehicle”).

With the understanding that the Prediction Horizon is not a ring buffer parameter, but a distance of road ahead of the vehicle, iQar's argument that "no 'route' exists that can be 'received' by Neiss's vehicle computer until after Neiss populates a Prediction Horizon worth of integration steps / buffer cells with road-specific angle, radius, and other data" does not withstand scrutiny. POR, 17. The Prediction Horizon—*i.e.*, the road section ahead of the vehicle—not only exists, but is also known by the computer that manages the ring buffer, such that relevant data characterizing that road section can be populated into the ring buffer. Indeed, Neiss makes clear that the vehicle's route is known prior to the ring buffer being populated: road data for the upcoming road are "read from the road map" and used to "fill[] these ring buffer cells." TESLA-1005, [0001], [0179]; *see* claim 1. It follows that, to retrieve road data for a particular section of road—*i.e.*, the Prediction Horizon—from the road map, that section of road would have to already be known to the system. *See id.*; Pet., 15-16.

#### IV. SCHRAMM-CLAPPER RENDERS OBVIOUS THE CHALLENGED CLAIMS

In the advanced Schramm-Clapper ground, the Petition explained the obviousness of combining Schramm’s route optimization process and Clapper’s teachings that vehicle speed may vary along a route to achieve a route optimization approach that accounts for different per-segment energy values based on per-segment variations in speed. Pet., 59-62. iQar’s rebuttals fail to engage with the teachings of this combination. Instead, iQar takes aim at purported deficiencies in each individual reference. This approach is legally deficient and should be rejected. *See In re Keller*, 642 F.2d 413, 426 (C.C.P.A. 1981) (“one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references”).

Specifically, iQar’s sole argument here—that “[t]he combined system will not calculate or determine any efficient speeds”—is unfounded. In an obviousness inquiry, such as that posed by the Schramm-Clapper ground, the satisfaction of claim language by the ***combined*** teachings of the advanced art combination is the relevant question. *See In re GPAC Inc.*, 57 F.3d at 1581 (“In determining whether obviousness is established ... ‘the test is what the ***combined teachings*** of the references would have suggested to those of ordinary skill in the art’” (emphasis added)). Yet iQar instead addresses purported shortcomings of each individual

reference, failing entirely to engage with the Petition's robust showing of how the *combination* leverages teachings of both references to render obvious the claims.

PO first addresses purported deficiencies of Schramm, arguing that “[r]ather than teaching a method for *determining* efficient speeds, Schramm’s system simply uses speed as an *input*.” POR, 31 (emphasis in original).

This ignores that the Schramm-Clapper ground relies not on the teachings of Schramm alone, but on the combined teachings of Schramm and Clapper to demonstrate obviousness of the recited determining of efficient speeds. To be sure, Schramm does take speed as an input. *See* Pet., 59; TESLA-1009, 5:14-20. But Schramm already recognizes that speed may vary along a route in its indication that that the speed received as an input is a “desired *average* speed at which the operator intends to drive.” TESLA-1009, 5:14-15 (emphasis added); *see* Pet., 59. A desired average speed encompasses the possibility that the actual speed of the vehicle may vary as it travels, as explained by iQar’s expert. TESLA-1053, 38:19-39:3 (“Q: I believe you testified that average speed could be achieved in different ways. And my question ways: Could those different ways be by driving at a constant speed throughout the route and driving at different speeds throughout the route? A. It could be achieved, yes, as you described.”).

Within the framework of Schramm’s route optimization process, which aims to identify an energy optimum route given a desired average speed, the speed is

explicitly allowed to vary by segment, based on Clapper's teachings of stored per-segment speeds. *See* Pet., 59-62. In this context, determination of an energy-optimum route—which, in the combination, takes into account variations in speed by segment—involves identification of the segments that make up that route, and thus also identification of the speed for each of those identified segments. *See id.*, 77-84. iQar's myopic focus on the purported deficiencies of Schramm fails to acknowledge the role of Clapper's speeds in this combination.

Indeed, instead of engaging with the combination, iQar pivots to an analysis of Clapper alone, arguing that “Clapper's speeds have nothing to do with efficiency and are not designed to achieve a best summation of energy values.” POR, 32. Once again, iQar's error is simple: it takes Clapper's disclosure in isolation, neglecting to consider that the Petition does not rely on Clapper's stored speeds in a vacuum, but instead leverages Clapper's teachings of varying per-segment speeds in combination with the route optimization process as described by Schramm. *See* Pet., 59-62. In this context, the objections iQar raises to Clapper's disclosure—namely, that “Clapper's database stored speeds may, of course, be extraordinarily *inefficient*,” or otherwise “have little to do with efficiency”—are irrelevant. POR, 32 (emphasis in original). The relevant aspect of Clapper's disclosure is simply its storage of per-segment speeds. *See* Pet., 59-62. And iQar does not dispute that Clapper discloses this.

Notably, iQar raises no objection to the combination of Schramm and Clapper, nor does iQar argue that Clapper's per-segment speeds should not be provided as input into Schramm's route optimization process. Indeed, iQar does not address the Schramm-Clapper combination at all, confining its argument to attacks on each reference individually.

In summary, iQar has failed to show any defect with the Schramm-Clapper combination approach to identifying an energy optimum route in which speed is allowed to vary along the route (consistent with Schramm's teachings of targeting a desired average speed) according to specific stored per-segment speeds, as taught by Clapper. And, having failed to address the actual ground presented in the Petition—*i.e.*, obviousness of the claims over the ***combination*** of Schramm and Clapper—iQar's misplaced attacks on each reference individually do not and cannot rebut the Petition's showings of obviousness.

**V. CONCLUSION**

For the foregoing reasons, Tesla respectfully requests a final written decision finding the Challenged Claims unpatentable.

Respectfully submitted,

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**CERTIFICATION UNDER 37 CFR § 42.24(d)**

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioner's Reply to Patent Owner's Response totals 5,588, which is less than the 5,600 allowed under 37 CFR § 42.24(b)(1).

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**CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on February 20, 2025, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response and all supporting exhibits were provided via email to the Patent Owner by serving the correspondence email addresses of record as follows:

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