

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

iQAR, INC. F/K/A INVENTLY AUTOMOTIVE, INC.,
Patent Owner

Case No. IPR2024-00541
Patent No. 7,925,426

PATENT OWNER'S PRELIMINARY RESPONSE

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I. INTRODUCTION

Patent Owner iQar, Inc. F/K/A Invently Automotive, Inc. respectfully submits that Petitioner Tesla, Inc.’s (“Petitioner”) Petition for *Inter Partes* Review (the “Petition”) of U.S. Patent No. 7,925,426 (Ex. 1001, “the ’426 Patent”) should be denied.

Petitioner challenges all four claims of the ’426 Patent (the “challenged claims”). Specifically, Petitioner argues that independent claim 1 of the ’426 Patent is obvious in view of the combination of U.S. Patent Publication No. 2004/0068359 to Neiss (Ex. 1005, “Neiss”) and U.S. Patent No. 6,317,686 (Ex. 1006, “Ran”), and that dependent claims 2-4 are obvious in view of Neiss, Ran, and/or one of two additional references.

Petitioner’s arguments that Neiss and Ran render obvious independent claim 1 are flawed and, thus, Petitioner does not have a reasonable likelihood of succeeding for any challenged claim. For example, the ’426 Patent claims require “receiving a route” and then “segmenting said route into segment destinations.” Petitioner relies on Neiss for these limitations, but Neiss does not receive or segment a route. Instead, it deliberately limits its consideration to an area around the current vehicle position (which it calls the “Prediction Horizon”) to reduce the amount of memory and calculations necessary. As Neiss explains, that Prediction Horizon may be a portion of the vehicle’s route, but is not the route itself.

Similarly, the challenged claims all require that for each segment destination three different speeds be calculated or determined. But the Petition fails to meet its burden to show a reasonable likelihood that the combination of Neiss and Ran render obvious these three separate speeds. Institution should be denied.

II. THE '426 PATENT

The '426 Patent describes devices, systems, and methods for managing and optimizing the power consumption of an automotive vehicle. Ex. 1001, 2:7-10. The '426 Patent explains that accurate control of fuel consumption may optimize the energy efficiency of a car. *Id.*, 1:6-15. Prior to its invention, however, drivers sought to manage fuel consumption in imprecise ways, such as slowing down, braking lightly, and carrying lighter loads. This did not effectively improve the energy efficiency of most cars. *Id.*

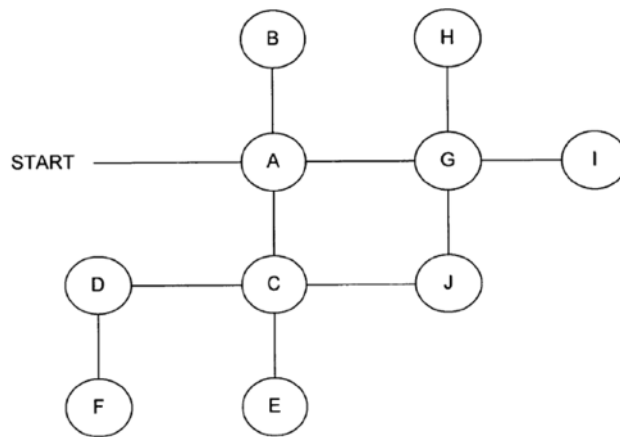
Thus, before the invention of the '426 Patent, there was a need to better manage a vehicle's power consumption. Ex. 1001, 1:52-65. The '426 Patent explains a solution to this problem, wherein the power management logic may be used by a motor control mechanism to control the application of power to the vehicle engine as the vehicle travels along a route to a destination. *Id.*, 2:26-29.

Importantly, the '426 Patent explains that, in one embodiment, calculating the applied power for a route involves segmenting the route into segment (or intermediate) destinations, and calculating a number of parameters for each

segment that can be used to calculate the optimal applied power for that segment.

Ex. 1001, 5:4-27. For example, a number of possible segments can be seen in Fig.

3A of the '426 Patent. Ex. 1001, Fig. 3A:



If the vehicle is currently located at START, one possible destination for the route is location C. Ex. 1001, 12:42-13:36. In that situation, one way to segment the route from START to C is by segmenting the route to treat location A as an intermediate destination, so that route START→A→C has two segments: START→A and A→C. *Id.*

The '426 Patent teaches that once the route has been segmented into segment destinations, both an optimized speed and a probable speed are calculated for each segment destination. Then, an efficient speed is determined for each segment destination based on the optimized speed and the probable speed.

The patent describes how the *optimized speed* can be calculated for a segment destination based on information about the vehicle's external

environment, its operational status, user command inputs, and/or operational parameters. *See generally* Ex. 1001, 15:48-16:63. “In general, any appropriate relationship between the information inputs, the speed (*e.g.*, the applied power) and the required energy may be used to determine an optimized speed.” *Id.*, 15:48-51.

In addition to the optimized speed, the patent describes how a separate ***probable speed*** is also calculated for each segment destination. In one embodiment, for example, the probable speed is the “speed [that] most likely approximates the optimal speed, based on previous trips.” Ex. 1001, 17:50-51. For example, the probable speed can be calculated based on historical route information. *See generally id.*, 16:64-18:56.

After both a probable speed and an optimized speed have been calculated for each segment destination, an ***efficient speed*** is determined based on the probable and optimized speeds. *See generally* Ex. 1001, 18:57-19:17. Once the efficient speed is determined for a route segment, then the amount of power for the vehicle to travel the route segment at that efficient speed can be applied to the vehicle’s engine. *See, e.g., id.*, 5:4-27, 11:6-25, 14:30-47, 18:57-19:17.

III. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner argues that a person of ordinary skill in the art (“POSITA”) relating to the subject matter of the ’426 Patent would have had a bachelor’s degree in electrical engineering, computer engineering, mechanical engineering

(including automotive engineering), civil engineering (transportation systems), physics, or a related field, and at least four years of experience (or the academic equivalent) in the field of transportation systems. Petition at 2-3. Petitioner also argues that additional graduate education could substitute for professional experience, and *vice versa*. *Id.*

For purposes of this Preliminary Response, Patent Owner does not dispute this characterization.

IV. CLAIM CONSTRUCTION

Petitioner argues that no claim constructions are necessary. Petition at 2 (citations omitted). For purposes of this Preliminary Response, Patent Owner does not believe that any specialized constructions are necessary because Petitioner fails to establish a reasonable likelihood of prevailing under any claim interpretation.

V. THE ASSERTED GROUNDS AND REFERENCES

The Petition seeks institution on the following Grounds, asserting obviousness under 35 U.S.C. § 103:

<u>Ground</u>	<u>Claim(s)</u>	<u>References</u>
1	1-2	Neiss-Ran
2	3	Neiss-Ran-Andersson
3	4	Neiss-Ran-Hosoda

As discussed in detail below, Petitioner fails to establish a reasonable likelihood of prevailing with respect to independent claim 1. Because the other challenged claims depend from claim 1, Petitioner fails to meet its burden for those claims for at least the same reasons. Thus, it is not necessary at this stage to address the additional deficiencies in Grounds 2 and 3.

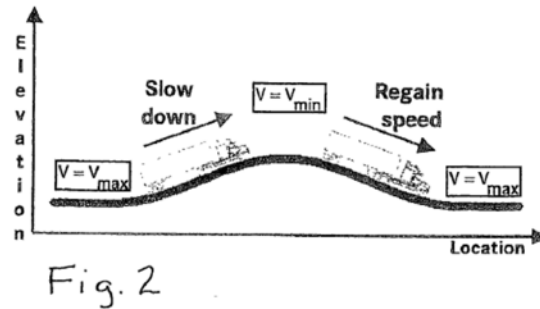
A. Overview of Neiss

Neiss is directed toward a rudimentary vehicular cruise control system in which an onboard computer, which it calls a “Predictive Cruise Control (PCC),” is intended “to replace or supplement the set speed of a conventional cruise control with a speed band.” Ex. 1005, ¶0031. Using the PCC, “[f]orward-looking terrain information is used to determine, as a function of position, a desired speed inside the speed band [] in order to maximize fuel savings.” *Id.*

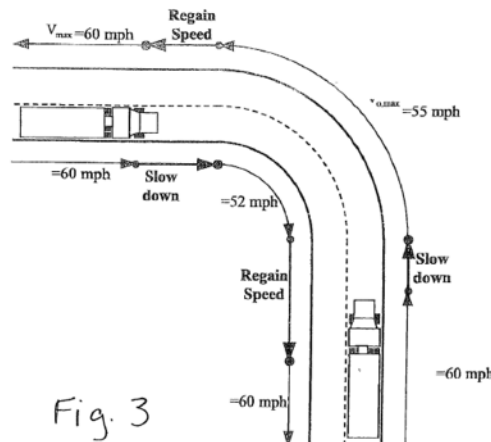
Neiss “iteratively calculates and stores in a memory vehicle control parameters that optimize the vehicle operating cost function for a predetermined Prediction Horizon along the route ahead of the vehicle.” Ex. 1005, Abstract. Thus, unlike the ’426 Patent, in Neiss’s iterative system, there is no route or destination. Instead, Neiss simply adjusts the cruise control in response to the geography immediately in front of the vehicle. For example, when a vehicle arrives at a hill, it “slows down as it moves uphill until it reaches a minimum speed on top of the hill, and regains speed on the downhill part, thus completely

converting the potential energy into kinetic energy,” as shown in Fig. 2. *Id.*,

¶0031, Fig. 2:



Similarly, as the vehicle “approaches a curve, the speed can automatically be reduced as shown in FIG. 3.” Ex. 1005, ¶0032, Fig. 3:



Neiss’s PCC performs these immediate calculations for a “Prediction Horizon,” which Neiss explains covers only “an area around the current vehicle positioned [sic].” Ex. 1005, ¶¶0161-0162. Neiss explains it considers only this limited area (and not the full route) to avoid a system “in which the stored values are determined in advance,” because doing only the most minimal calculations

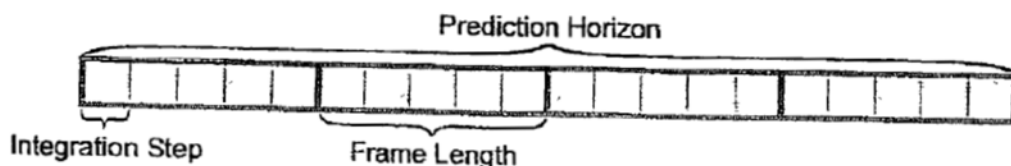
possible means that “[l]ess memory is needed,” and “[t]here is no need for a previous ‘record drive.’” *Id.*, ¶¶0163, 0164, 0166.

Neiss continues distinguishing its system from a route-based system (like that of the ’426 Patent) by explaining its decision to calculate a speed based on the vehicle’s current position rather than a road it may travel on:

While the optimization calculation could be performed for every computational cycle given enough computing power, ***this approach was not used*** in the current implementation. Rather, a new optimization calculation only occurs once the vehicle has covered a specified distance, which is referred to hereinafter as a ‘frame’, or when the set speed is changed.

Ex. 1005, ¶0169 (emphasis added).

As shown in Fig. 10, Neiss breaks up the area around the current vehicle position (what Neiss calls its “Prediction Horizon”) into “Frames,” and in turn breaks up each Frame into “Integration Steps.” Ex. 1005, ¶0170, Fig. 10:



But neither Neiss’s Prediction Horizon, Frames, nor Integration steps correspond to a route or route segment because these are simply subdivisions in the direction the vehicle is currently facing and not the route the vehicle will take.

For a Prediction Horizon, Neiss calculates an “optimal velocity” for the vehicle, which “is considered to be constant for small distances h.” Ex. 1005, ¶0162. The “parameter ‘Number of Frames’ determines the rate at which the optimal trajectory is updated,” *e.g.*, the rate of four frames per Prediction Horizon shown in Fig. 10. *Id.*, ¶0170.

Neiss thus purports to calculate only one speed across a Prediction Horizon, which it calls the “optimal velocity.” This is again fundamentally different than the ’426 Patent, in which three different speeds – a probable speed, an optimized speed, and an efficient speed – are calculated or determined for each of a plurality of route segments.

B. Overview of Ran

For independent claim 1, the Petition cites to Ran only for its limitations [1e] and [1f], “calculating a probable speed” and “determining an efficient speed based on said optimized speed and said probable speed,” respectively. *See* Petition at 51-54, 59. Ran is directed to a “traffic information system for predicting travel times [that] utilizes Internet based collecting and disseminating of information.” Ex. 1006, Abstract. Unlike the on-vehicle systems of both the ’426 Patent and Neiss, Ran’s traffic information system resides on a remote server comprising traffic forecast server 6, as shown in Fig. 1. Ex. 1006, Fig. 1:

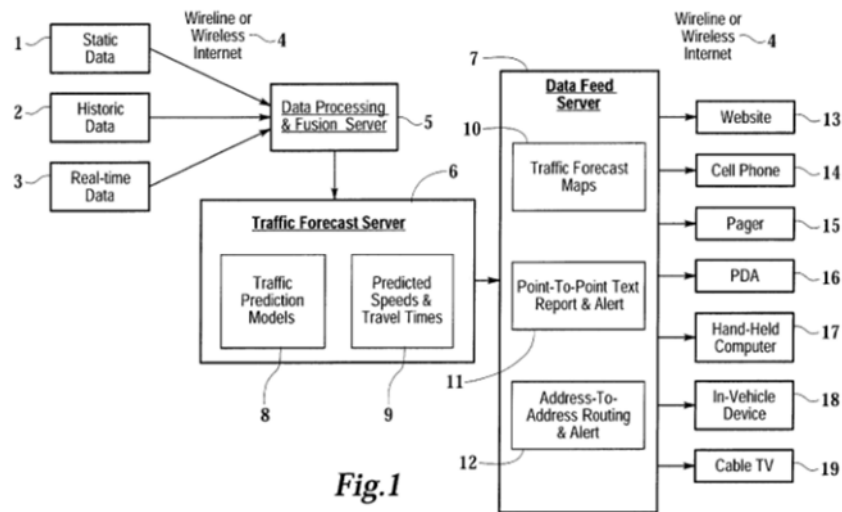


Fig.1

As part of Ran’s “Internet-based traffic prediction system,” the traffic forecast server uses traffic prediction models to generate “a set of basic output of predicted speeds and travel times.” Ex. 1006, 17:7-16, 19:58-60. These predicted speeds and travel times can then be fed to a device over the Internet. *Id.*, 17:17-33, Fig. 1.

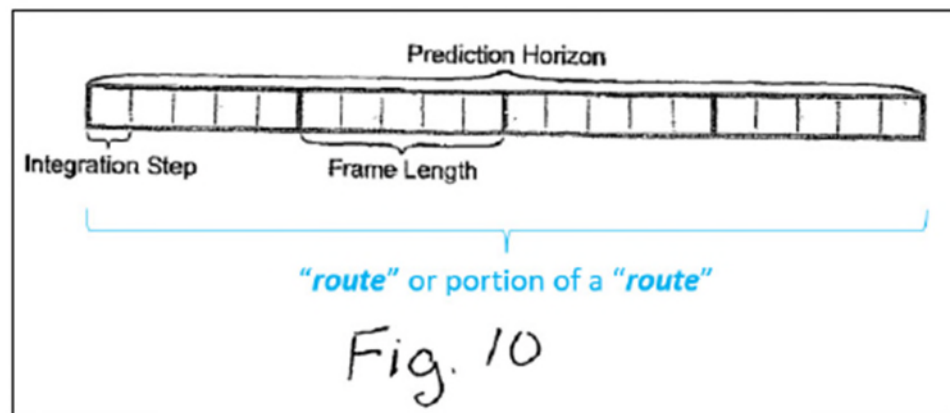
VI. THERE IS NO REASONABLE LIKELIHOOD THAT PETITIONER WILL PREVAIL ON ANY CLAIM

All of Petitioner’s Grounds rely on the combination of Neiss and Ran. Because Petitioner has not shown that Neiss or Ran disclose all limitations of independent claim 1, Petitioner fails to establish a reasonable likelihood of prevailing with respect to any challenged claim.

**A. Neiss Does Not Disclose “A Computer Device Receiving a Route”
(All Challenged Claims)**

Petitioner relies exclusively on Neiss to allege that the combination of Neiss and Ran discloses the '426 Patent claim 1 limitation of “a computer device receiving a route.” Petition Limitation [1a]; Petition at 26-33. Because Neiss does not disclose receiving a route, Petitioner has failed to meet its burden.

Petitioner argues that Neiss’s optimization algorithm “iteratively calculat[es]...vehicle control parameters that optimize the vehicle operating cost function for a predetermined distance (referred to as a Prediction Horizon) along the route ahead of the vehicle,” and that this Prediction Horizon shown in blue in the below figure “corresponds to *a route*, e.g., because it constitutes a path being traveled by the vehicle.” Petition at 27-28 (emphasis original).



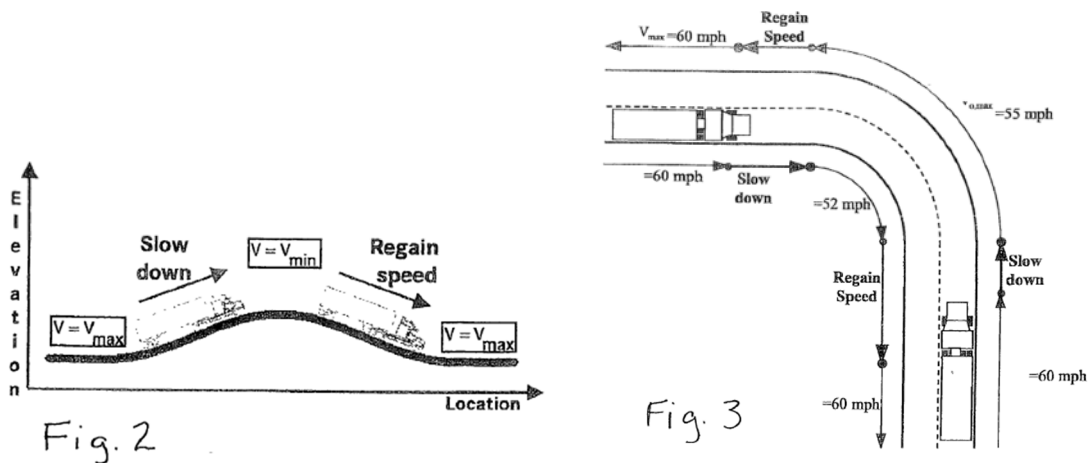
TESLA-1005, FIG. 10 (annotated)

Petitioner’s conclusion that Neiss’s Prediction Horizon is a “route” is unsupported. The '426 Patent repeatedly explains that a “route” is the path from

the vehicle's starting position to a final destination. *See, e.g.*, Ex. 1001, 11:9-13 (“To determine an optimally efficient speed (or the optimal power to be supplied to the engine), ***a route is determined 201 from the starting position and an actual or estimated ending position***, the route is segmented 203 into one or more segments”), 11:27-28 (“The route is determined based on the current position of the vehicle and a final destination position.”) (emphasis added); *see also* 12:11-23 (discussing a “highway” and “work” as destinations), 12:42-13:36, Fig. 8 (listing “1600 Pennsylvania Ave Washington DC” as a destination).

In contrast, Neiss's Prediction Horizon is not a route from the starting position and an actual or estimated ending position. Rather, it is simply a portion of the road immediately in front of, and visible from, the vehicle's current location. *See, e.g.*, Ex. 1005, ¶0048 (“the controller gains are calculated for the approaching road within the Prediction Horizon”), ¶0162 (“For an area around the current vehicle positioned [sic] (‘Prediction Horizon’)”).

Indeed, there is no destination in Neiss at all – the word “destination” never even appears in its disclosure. Neiss's system is completely unaware of either the vehicle's final destination or any intermediate destinations. Rather, Neiss simply relates to adjusting a vehicle's cruise control to compensate for the geography immediately visible in front of it, such as the hill shown in Fig. 2 or the curve shown in Fig. 3. Ex. 1005, Figs. 2-3:



Neiss's Prediction Horizon is nothing more than a fraction of this immediate geography. Indeed, Neiss expressly states that its Prediction Horizon is simply a “predetermined distance ... along the route ahead of the vehicle.” Ex. 1005, ¶0015. By defining the Prediction Horizon as a distance “along the route ahead of the vehicle,” Neiss makes clear that it is not the route, itself.

Petitioner seems to understand that Neiss's Prediction Horizon is not the claimed “route” because it goes on to argue that:

Additionally, or alternatively, Neiss discloses that the vehicle traverses an overall route (e.g., one with a starting point and an ending point or final destination where the vehicle stops) and that its optimization operations are performed iteratively for portions of the overall route (ahead of the vehicle as the vehicle travels the route to its final destination). Therefore, in Neiss-Ran, a POSITA would have understood that a vehicle travels an overall route, with optimizations performed on each iteratively updated prediction horizon (predetermined distance) ahead of the vehicle as it travels this route.

Petition at 28 (citations omitted).

This alternative argument also fails because the challenged claims require “receiving a route,” (limitation [1a]) which is not the same as “travers[ing] an overall route” simply because a vehicle necessarily has a starting and ending point. Simply traveling over a route is not the same as “receiving a route,” particularly when no record of the route is maintained. This is further confirmed by the requirements that the received route be segmented into “segment destinations” (limitation 1[c]) and then “for each of said segment destinations” (limitation [1c]) calculating an optimized speed and a probable speed (limitations [1d1] and [1e]) and then determining an efficient speed for each segment destination “based on said optimized speed and said probable speed.” Limitation [1f]. The claimed method concludes by applying calculated power corresponding to the determined efficient speed so that the vehicle will “travel said segment destination.” Limitation [1g]. From this, it is clear that the route must be received before it can be segmented, the speeds calculated and determined, and the vehicle can travel the segment destinations. Neiss does not disclose this and its Prediction Horizon “along the route ahead of the vehicle” is not sufficient.

Petitioner concludes by arguing that “[i]f it is determined that the present limitation requires receiving an *entire* route (i.e., an end-to-end route with a starting point to a final destination) *at once*, a POSITA would have found that to be obvious in view of Neiss-Ran.” Petition at 31 (emphasis original). This argument

also fails. As discussed above, Neiss fails to disclose any relevant “route”, and so clearly does not and cannot teach an “entire route” for the same reasons.

Moreover, Petitioner presents no evidence in support of its conclusion that an “entire route” would have been obvious in view of Neiss.¹ This is improper hindsight.

Receiving an entire route from start to finish in advance (rather than simply knowing the path the vehicle took by the end of the trip) is a non-trivial concept that Petitioner simply hand-waves away. Petitioner does not explain how or why a POSITA would take a system like Neiss, where a calculation is performed only for the road immediately in front of a vehicle with no destination in mind, and modify it to perform a series of calculations for an entire route to a specific destination.

Petitioner cites a single background reference (that is not part of its obviousness combination) to argue that “a vehicle onboard computer receiving an entire end-to-end route (e.g., from external map applications) was well-known in the context of vehicle control systems and enabled receipt of accurate routes that, e.g., account for real-time events, such as road and/or traffic conditions.” Petition at 32. However, Petitioner does not articulate any credible reason for modifying Neiss to incorporate an entire end-to-end route.

¹ The Petition references “Neiss-Ran,” but does not cite or analyze Ran for this limitation.

Similarly, modifying Neiss to take into account route information also makes no sense. Petitioner says that “receiving the entire route at once would be computationally efficient because it would enable quicker computations.” Petition at 32. Not only does it provide no support for this conclusion, but it is wrong. A simple system like Neiss’s, which only makes a single calculation at a time, without worrying about a route or destination, is already as computationally simple and efficient as possible – trying to expand this to an entire route makes it more, not less, complicated.

Indeed, Neiss expressly explains that its PCC computer deliberately implements a “cost minimizing algorithm” that covers only “an area around the current vehicle positioned [sic].” Ex. 1005, ¶¶0161-0162. Neiss explains that it does so in order to avoid a system “in which the stored values are determined in advance,” because doing only the most minimal calculations possible means that “[l]ess memory is needed.” Ex. 1005, ¶¶0163, 0164; *see also* ¶0169 (“While the optimization calculation could be performed for every computational cycle given enough computing power, this approach was not used in the current implementation. Rather, a new optimization calculation only occurs once the vehicle has covered a specified distance, which is referred to hereinafter as a ‘frame’, or when the set speed is changed. In addition, the calculation is

distributed over several computational cycles to reduce the computational burden.”).

A system like that of the ’426 Patent performs calculations for an entire route. These are exactly the sort of complicated and memory intensive computations that Neiss expressly disparages. Petitioner’s unsupported argument that a POSITA would have been motivated to modify Neiss in this way is mistaken.

B. Neiss Does Not Disclose “Said Computer Device Segmenting Said Route into Segment Destinations” (All Challenged Claims)

Petitioner relies entirely on Neiss to allege that Ground 1 discloses the ’426 Patent claim 1 limitation “said computer device segmenting said route into segment destinations.” Petition Limitation [1b]; Petition at 34-37. Petitioner’s argument fails because it is premised on a faulty claim construction.

While Petitioner states that “[n]o claim constructions are necessary,” (Petition at 2), for this limitation Petitioner’s argument is premised on its assumption that “the present limitation would be understood as encompassing segmenting a route into a plurality of segments, where each segment has an endpoint/destination.” Petition at 34. In other words, Petitioner seeks to broaden the claims by replacing the claim term “segment destinations” with simply “segments.”

Petitioner seeks to justify its claim construction by alleging that “[t]he ’426 Patent’s specification does not use the phrase ‘segment destinations,’ and that the specification “describes segmenting the route into segments (and not segment destinations, as claimed).” Petition at 34. But that is flatly wrong. The ’426 Patent’s specification discloses multiple embodiments of segmenting a route not merely into segments (as Petitioner contends) but rather into the claimed “segment destinations.” *See, e.g.*, Ex. 1001, 5:4-10 (“The step of calculating an applied power may include determining a route, ***segmenting the route into one or more segment (or intermediate) destinations***, calculating an energy efficient speed for the vehicle to travel ***to the segment destination***, determining an optimized speed for the vehicle to travel ***to the segment destination***, and calculating the applied power from the optimized speed for all of the segments.”) (emphasis added), 9:30-36, 14:16-21, 20:13-16. Because Petitioner does not address the claim limitation and Petitioner’s claim construction is unsupported, its Petition fails.

In sum, Petitioner improperly assumes that a “segment destination” is a “segment” in an effort to force Neiss—which does consider units of data but never makes any destination determinations—into the claim scope. This is wrong. Even if it is assumed that Neiss’s system considers “segments” of a route, it indisputably does not identify or employ any “segment destinations.” Petitioner's re-writing of the claims should be rejected.

C. Petitioner’s Neiss-Ran Combination Does Not Disclose “Said Computer Device for Each of Said Segment Destinations:” “Calculating an Optimized Speed,” “Calculating a Probable Speed,” “Determining an Efficient Speed,” and “Applying the Calculated Power” (All Challenged Claims)

Claim 1 of the ’426 Patent is directed to a method of managing the power consumption of a vehicle. It does this by calculating an *optimized speed* and calculating a *probable speed* for each of said segment destinations. Limitations [1d1] and [1e]. These two speeds are then used to determine an *efficient speed*. Limitation [1f]. Only then can the calculated power corresponding to that efficient speed be determined and applied to the vehicle engine to travel the segment destination. Limitation [1g]. Claim 1 makes clear that these three speed are calculated or determined “for each of said segment destinations” (Limitation [1c]) and the claim requirement that the calculated power be applied “to the vehicle engine to travel said segment destination” (Limitation [1g]) makes clear that the calculation and determination of these speeds must occur before the vehicle travels the segment destination.

Petitioner’s argument fails because the Petition does not identify the three claimed speeds that must be calculated or determined for each segment destination.

Petitioner relies entirely on Neiss for the claimed calculated *optimized speed*. Petition at 41-45. Specifically, Petitioner argues “an ‘optimal velocity’ is iteratively calculated by Neiss’s PCC system for each Integration Step in a Frame,

which has an endpoint.” Petition at 42. As explained above, Neiss’s Prediction Horizon is not the claimed “route” and, thus, Neiss’s Frame is not a claimed “segment destination.” But accepting for purposes of argument Petitioner’s contention, Petitioner alleges that the velocity that is the result of Neiss’s iterative calculations is the *optimized speed*.

Petitioner then relies on Ran, which Petitioner contends includes “teachings of using traffic prediction models ... to calculate predicted speeds for upcoming road segments based at least on real-time traffic conditions on those road segment(s).” Petition at 51. Thus, Petitioner argues that Ran teaches calculating the claimed *probable speed* “for the route segment ... using at least real-time traffic conditions.” *Id.* at 52.

The Petition fails, however, because it does not identify a third *efficient speed* that is determined “based on said optimized speed and said probable speed” as required by the challenged claims. Petitioner argues that “Neiss-Ran’s updated optimal value for speed corresponds to an efficient speed” Petition at 58. But Petitioner already identified Neiss’s iteratively calculated speed as the claimed *optimized speed*. Petition at 41-45. That speed cannot also be the separately claimed *efficient speed*, particularly since the challenged claims require that the efficient speed is determined “based on said optimized speed.” Limitation [1f].

Petitioner appears to recognize this failing and, thus, argues that because Neiss iteratively calculates the vehicle's speed, one of those iterations may be the optimized speed while "an updated or re-optimized velocity value" could be the efficient speed. Petition at 57. But this, too, fails because Petitioner's proposal is that it would be "obvious to modify Neiss's algorithm so that – instead of using a current velocity for an existing frame where the vehicle is driving – the optimization algorithm uses the real-time traffic-based predicted speed for the route segment for which the optimization is being performed (as Ran discloses)." Petition at 55.

The combination proposed by Patent Owner also falls short for additional reasons. First, Neiss uses the vehicle's current velocity as the input to its iterative calculation because that is the speed that the vehicle is going, and adjustments should be made smoothly around that speed. Indeed, it often would not be safe to replace the current speed with Ran's calculation of the expected speed of traffic. For example, suppose the vehicle is on the highway and traffic is generally going at 65 miles per hour, but the vehicle has slowed to 50 miles per hour to exit the freeway. Calculating the vehicle's future speed based on the traffic speed rather than the vehicle's current speed would be dangerous. Similarly, if Ran predicted that traffic would be slow (say 40 miles per hour) but in reality the vehicle's lane is moving normally at 65 miles per hour, it would again be dangerous to calculate a

speed based on the assumed traffic rather than the vehicle's actual current speed.

Petitioner provides no sufficient motivation for a POSITA to replace Neiss's use of the vehicle's actual current speed with Ran's calculated traffic speed.

Second, even were a POSITA motivated to “modify Neiss's algorithm so that – instead of using a current velocity for an existing frame where the vehicle is driving – the optimization algorithm uses the real-time traffic-based predicted speed for the route segment for which the optimization is being performed (as Ran discloses)” (Petition at 55), this would not meet the challenged claims. That modification would eliminate what Petitioner had argued was the claimed *optimized speed*. Further, the result of that iteration would be based on Ran's predicted traffic speed (what Petitioner contends is the *probable speed*) and not “based on said optimized speed and said probable speed” as the Challenged Claims require. Limitation [1f].

Thus, even accepting Petitioner's proposed modification, the combination does not calculate an optimized speed, calculate a probable speed, and then determine an efficient speed based on the optimized and probable speeds.

VII. CONCLUSION

For at least the foregoing reasons, Patent Owner respectfully submits that institution should be denied.

Date: May 13, 2024

Respectfully submitted,

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WORD COUNT CERTIFICATION

The undersigned certifies that the foregoing paper complies with the type-volume limitation in 37 C.F.R. § 42.24. According to the utilized word-processing system's word count, the paper—excluding any portions mentioned in § 42.24(a)(1)—contains 4,406 words.

Date: May 13, 2024

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