UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

GRANITE VEHICLE VENTURES, LLC Plaintiff, v. TESLA, INC., Defendant.	Civil Action No. 2:24-cv-01007-JRG

DEFENDANT'S INVALIDITY CONTENTIONS

Pursuant to Patent Rules 3-3 and 3-4 and the First Amended Docket Control Order (D.I. 42), Defendant Tesla, Inc. ("Tesla" or "Defendant") respectfully submits these Invalidity Contentions and accompanying document production with respect to the claims identified by Plaintiff Granite Vehicle Ventures, LLC's ("Granite" or "Plaintiff") in its Patent Rule 3-1 Disclosures.[1] Defendant makes these invalidity contentions based on its present understanding of Plaintiff Granite Vehicle Ventures, LLC's ("Granite" or "Plaintiff") Infringement Contentions, served on March 12, 2025, and in part on the contended scope of the asserted claims therein.

Defendant also submits its Subject Matter Eligibility Contentions in accordance with the Court's July 25, 2019 Standing Order Regarding Subject Matter Eligibility Contentions Applicable to All Patent Infringement Cases Assigned to Chief District Judge Rodney Gilstrap ("Order Regarding Eligibility") and the First Amended Docket Control Order.

The currently asserted patents, as reflected in Plaintiff's Infringement Contentions, are U.S. Patent Nos. 11,597,402 ("the '402 patent"); 11,738,765 ("the '765 patent"); and 12,037,004 ("the

[1] Defendant has also made source code available for inspection.

’004 patent”) (collectively, the “Asserted Patents” or “Patents-In-Suit”). As disclosed in its respective Patent Rule 3-1 Infringement Contentions served on Defendant, Plaintiff asserts the following patents and claims:

Patent	Asserted Claims
’402 patent	4, 6, 8, 9-11 and 13
’765 patent	1, 3-8, and 10-20
’004 patent	1-24, 27, and 29-39

(collectively, the “Asserted Claims”). To the extent that Plaintiff is allowed to alter or modify its Infringement Contentions and/or Asserted Claims, Defendant reserves the right to respond, including with amendments and other modifications related to Defendant’s Invalidity Contentions. As detailed further below, each of the Asserted Claims is invalid under at least 35 U.S.C. §§ 101, 102, 103 and/or 112. Defendant reserves the right to prove the invalidity of the Asserted Claims on bases other than those required to be disclosed in these disclosures pursuant to Patent Rule 3-3.

I. PRELIMINARY STATEMENT

Defendant’s Invalidity Contentions are based on Defendant’s current knowledge, understanding, and belief regarding the Asserted Patents, the prior art, Plaintiff’s infringement theories (inasmuch as they can be inferred from its Infringement Contentions), Plaintiff’s alleged priority dates for the Asserted Claims,[2] and the facts and other information available as of the date of these invalidity contentions. Defendant’s investigation, discovery, and analysis of information

[2] As set forth in Granite’s March 12, 2025, Infringement Contentions, Tesla understands Granite’s asserted priority date for all of the Asserted Patents to be September 25, 2015. Defendant does not concede that Granite’s claims of priority are correct.

related to this action is ongoing. Additional discovery, elucidation of Plaintiff's infringement contentions, and/or orders of the Court may require Defendant to amend or supplement these invalidity contentions, and Defendant expressly reserves the right to do so as this case proceeds. For example, as discussed further below, Defendant has served subpoenas seeking discovery into the Asserted Patents and the prior art. These contentions represent Defendant's good-faith effort to provide a comprehensive identification of prior art relevant to this case, but Defendant reserves the right to modify or supplement its prior art list and invalidity contentions at a later time with, or based upon, case developments or pertinent information that may be subsequently discovered, including based on invalidity contentions served in other litigations brought by Plaintiff.

In addition to the information explicit disclosed in this document, including all exhibits thereto, Defendant incorporates by reference all background and technical discussions, arguments, mappings of the prior art to the claims of the Asserted Patents, and supporting evidence from, and any exhibits and attachment thereto, *Inter Partes Review* Case Nos. IPR2025-00943 ("the '402 IPR Petition"), -00944 ("the '765 IPR Petition"), -01034 and -01035 ("the '004 IPR Petitions") (collectively, "the IPR Petitions") as if fully set forth herein.

A. No Waiver

Nothing in these invalidity contentions is intended, nor should be construed, as a waiver of any noninfringement position or argument under, *e.g.*, 35 U.S.C. §§ 101 or 112. Defendant's statements herein (including the accompanying claim charts) reflect Defendant's present understanding of the purported scope of the claims as alleged by Plaintiff in its Infringement Contentions.

The patent claims have yet to be construed. As a result, Defendant has based these invalidity contentions upon its knowledge and understanding of the potential scope of the Asserted Claims at this time, and, in part, upon the apparent interpretations of the Asserted Claims advanced

by Plaintiff in its Infringement Contentions.[3] The citation of prior art herein and the accompanying exhibits are not intended to reflect Defendant's claim construction contentions, which will be disclosed in due course in accordance with the First Amended Docket Control Order. Defendant may disagree with Plaintiff's interpretation of the meaning of many terms and phrases in the Asserted Claims. These invalidity contentions do not represent Defendant's agreement or view as to the proper interpretation of any claim term contained therein. Any similarity between any apparent claim interpretation in any of Defendant's charts of prior art references and Plaintiff's contentions is not an admission or agreement with Plaintiff about the meaning of any claim term, but rather a reflection of the fact that the subject matter Plaintiff believes is claimed is present in the prior art, or that the claims are otherwise invalid. These invalidity contentions are made in the alternative, and should not be interpreted to rely upon, or in any way affect, the non-infringement arguments Defendant may assert in this case. Defendant reserves the right to amend, supplement, or materially modify its invalidity contentions as each case proceeds.

Defendant further reserves the right to revise these invalidity contentions in view of the Court's construction of terms and phrases recited in one or more of the Asserted Claims, additional information obtained during discovery, additional infringement theories put forth by Plaintiff during fact and/or expert discovery, any findings as to the priority date(s) of the Asserted Claims, and/or positions that Plaintiff, its fact witnesses, or its expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues, as permitted by the Court. Defendant further reserve the right

[3] Defendant does not concede that Plaintiff's apparent interpretation of the claims is correct, but rather asserts the well-established principle that whatever infringes a claim if later in time anticipates if earlier in time. *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1378 (Fed. Cir. 2001). Thus, where Plaintiff for purposes of its infringement case alleges that a feature of an accused product meets a particular limitation recited in one or more of the Asserted Claims, then that feature, should it be found in the prior art, would also cause that limitation to be met for invalidity purposes.

to supplement their accompanying P.R. 3-4(b) document productions should they later discover additional prior art documents, information, testimony, prior art systems and related documentation, and/or software or hardware code, including information provided by third parties after the date of service of these Invalidity Contention and Subject Matter Eligibility Contentions.

Defendant also reserves the right to amend, supplement, or materially modify its invalidity contentions in response to any claim construction or interpretation positions that Plaintiff may take. Defendant also reserves the right to assert that a claim is indefinite, not enabled, or fails to meet the written description requirement of 35 U.S.C. § 112 based on any claim construction or interpretation position Plaintiff may take in these cases, in response to the IPR Petitions, or based on any claim construction the Court may further adopt in these cases.

Defendant may further rely on inventor admissions concerning the scope or state of the prior art relevant to the Asserted Claims, the patent prosecution histories of the Asserted Patents, related patents and/or patent applications, any deposition or trial testimony of the named inventors on the Asserted Patents, and the papers filed and any evidence produced or submitted by Plaintiff in connection with these cases or other related litigation. Defendant reserves the right to contend that one or more of the Asserted Claims are invalid, *inter alia*, as derived from another in the event Defendant obtains evidence that one or more of the named inventors did not invent the subject matter in the Asserted Claims.

B. No Admission

Nothing disclosed herein is an admission or acknowledgement that any product accused of infringement by Plaintiff in its Infringement Contentions (the "Accused Instrumentality"), or any of Defendant's other products or services, infringe any of the Asserted Claims.

To the extent that any of the prior art references disclose the same functionality or feature of any of the Accused Products, Defendant reserves the right to argue that said feature or

functionality does not practice any element of any of the Asserted Claims, and to argue, in the alternative, that if said feature or functionality is found to practice any element of any of the Asserted Claims, then the prior art reference demonstrates that the element is not novel, is obvious, and/or is otherwise not patentable.

Attached hereto are representative claim charts that identify where the elements of the Asserted Claims may be found in the prior art. The references cited in the attached claim charts may disclose the limitations of the Asserted Claims expressly and/or inherently. The suggested obviousness combinations may be presented in conjunction with or in the alternative to Defendant's contentions regarding anticipation. Where Defendant contends that an element or elements would have been obvious over a reference alone or in combination with one or more additional references, additional exemplary information regarding the nature of the combinations and motivations to combine may be found in the charts themselves and/or Section II.DII.D of this cover pleading. These obviousness combinations should not be construed to suggest that any reference included in any combination is not anticipatory in its own right. Further, to the extent that Plaintiff contends that any of the references identified do not constitute prior art under 35 U.S.C. § 102, Defendant reserves the right to rely upon other prior art references in the same patent family with substantially identical disclosures as evidence of invalidity based on the same theories as those disclosed below. Defendant may also rely on other prior art references which are not charted, including those listed in the table below (*see infra* Section II.A) or produced together with these contentions, both as evidence of the state of the art, and as invalidating prior art as the relevance of those references becomes known.

C. Reservation of Rights

Prior art not currently included in this disclosure may become relevant. Defendant is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the

Asserted Claims are not disclosed in the prior art identified by Defendant. Defendant reserves the right to identify other references that would have made the addition of the allegedly missing limitation to the disclosed device or method obvious or show that the allegedly missing limitation would have been known or readily apparent to one of ordinary skill in the art at the time of the invention in light of the disclosure of the prior art at issue. Defendant further reserves the right to rely on any of the cited references in order to demonstrate the state of art at the alleged times of invention and as evidence of the knowledge of one of ordinary skill in the art in support of any motivations to modify or combine the charted prior art references with other references or knowledge.

Plaintiff may also be aware of additional prior art that is not known to Defendant. To the extent that Plaintiff produces relevant prior art after these contentions are served, Defendant may supplement its invalidity contentions with prior art contained in such production once it has had a fair opportunity to review, analyze, and chart such prior art. Defendant reserves the right to amend its invalidity contentions with any potential prior art known by Plaintiff but not yet disclosed to Defendant.

Further, additional information about prior art may be known to third parties, and Defendant has served subpoenas seeking this information. Defendant reserves the right to amend its invalidity contentions with any prior art received via a subpoena.

Defendant provides these invalidity contentions only for the claims that have been asserted by Plaintiff, but reserves the right to seek invalidation of all claims in the Asserted Patents.

D. Ongoing Investigation

Defendant expressly reserves the right to amend its disclosures and document production to account for evidence uncovered as its investigation continues. Such amendments include identifying and relying on additional references that may result from Defendant's further search

and analysis, including from custodians relevant to the issues in this case or from discovery, including third-party discovery that has just commenced. Defendant reserves the right to supplement these contentions in light of any additional prior art that might be subsequently disclosed by Plaintiff, including in response to Defendant's discovery requests. Defendant further reserves the right to supplement its contentions with any facts, evidence, arguments, and/or prior art in response to any arguments or evidence from Plaintiff, relevant Court orders, and/or developments in this case, including but not limited to issues on which Plaintiff has the burden such as priority and conception and reduction to practice of the Asserted Patents, as well as statements made in proceedings on the IPR Petitions. Defendant anticipates receiving discovery from third parties believed to have knowledge, documentation and/or corroborating evidence concerning some of the prior art listed herein and/or additional prior art. These third parties include, but are not limited to, the authors, employers of authors, inventors, assignees, or former or current employees of assignees, of the references identified in these invalidity contentions. For example, to date, Defendant has subpoenaed information from the following companies and anticipates receiving relevant information to supplement its contentions:

- IBM Corporation, served May 19, 2025
- Mobileye Global Inc., served on May 22, 2025
- Mercedes-Benz USA, LLC, served May 23, 2025
- Mercedes-Benz Research & Development North America, Inc., served May 23, 2025
- Subaru of America, Inc., served May 23, 2025
- Waymo LLC, served May 21, 2025

Defendant additionally reserves the right to supplement these contentions in light of any newly discovered information produced by these or other companies from which Defendant is seeking or may seek discovery as well as based on Defendant's own internal investigation within Tesla.

II. PRIOR ART INVALIDITY OF THE ASSERTED PATENTS

A. Identification of Prior Art

The claim charts attached as exhibits to these Invalidity Contentions identify items of prior art[4] that each anticipates or renders obvious one or more asserted claims. In addition, Defendant below identifies additional items of prior art that Defendant may rely upon for additional background or anticipation and/or obviousness arguments, including motivations to combine references. Defendant's investigation of the prior art is ongoing. Defendant expressly reserves the right to rely upon other prior art, including products that embody the patents, in supplemental invalidity arguments. Certain prior art publications identified below describe or are otherwise associated with corresponding prior art systems. In addition, Defendant may also rely on each prior art publication as an independent basis for invalidity separate and distinct from its corresponding prior art system and/or other related publications. Each of the identified references also serve to show the state of the art relevant to the Asserted Patents and Defendant reserves the right to rely on them as well as other prior art known to a Person of Ordinary Skill in the Art ("POSA") that may not be identified herein for that purpose.

[4] Defendant's disclosure of prior art is premised on the alleged priority dates of the Asserted Patents as identified in Plaintiff's Infringement Contentions. Defendant reserves the right to modify, amend, or supplement its invalidity contentions with additional prior art references if any Asserted Claim is shown to not be entitled to the respective alleged priority date or if Plaintiff alleges any other priority date for any of the Asserted Claims. Notwithstanding that reservation of rights, Defendant also reserves the right to argue that they have been unduly prejudiced should Plaintiff allege a different priority date for any of the Asserted Claims, and that accordingly Plaintiff should not be allowed to do so.

These Invalidity Contentions are, in part, based upon Plaintiff's apparent interpretations of the Asserted Claims of the Asserted Patents, to the extent those interpretations can be discerned from Plaintiff's Infringement Contentions and apparent claim constructions in this case. Defendant disagrees with Plaintiff's Infringement Contentions, and these Invalidity Contentions are not, and should not be construed as, an endorsement or acceptance of any of Plaintiff's contentions or interpretations of the Asserted Patents.

Patents and Printed Publications
"Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems," J3016, SAE International, January 2014 (TSLAGVV000122978)
"Guidelines for Safe On-Road Testing of SAE Level 3, 4, and 5 Prototype Automated Driving Systems (ADS)," J3018 SAE International, March 2015 (TSLAGVV000139339)
"Preliminary Statement of Policy Concerning Automated Vehicles," National Highway Traffic Safety Administration, May 2013 (TSLAGVV000139351)
"U.S. Department of Transportation Releases Policy on Automated Vehicle Development," National Highway Traffic Safety Administration, May 2013 (TSLAGVV000139365)
Borrelli, F., Morari, M., "Model Predictive Control," 2014 (TSLAGVV000121478)
Goulart, P., Borrelli, F., "Convex Optimization," 2014 (TSLAGVV000121500)
Noh, H., Hong, S., Han, B., "Learning Deconvolution Network for Sematic Segmentation," 2015 (TSLAGVV000121290)
Thrun, S., Montemerlo, M., "The GraphSLAM Algorithm with Applications to Large-Scale Mapping of Urban Structures," May 2006 (TSLAGVV000121605)
"DARPA Grand Challenge (2004)," Wikipedia (TSLAGVV000121693)
Popovic, Z., Bai, S., "Automotive Lane-Level Positioning: 2010 Status and 2020 Forecast," October 2011 (TSLAGVV000121300)
Carvalhoa, A., Lef evrea, S., Schildbacha, G., Konga, J., Borrellia, F., "Automated Driving – The Role of Forecasts and Uncertainty – A Control Perspective," May 2015 (TSLAGVV000121323)
Soloviev, A., Popovic, Z., Mochizuki, Y., "High Precision Positioning in Difficult GPS Environments for Cooperative Vehicle Safety Applications," September 2010 (TSLAGVV000121368)
Kong, J., Pfeiffer, M., Schildbach, G., Borrelli, F., Kinematic and Dynamic Vehicle Models for Autonomous Driving Controls Design, 2015 IEEE Intelligent Vehicles Symposium (IV), August 2015 (TSLAGVV000121403)
Borrelli, F., Jones, C., Morari, M., "Model Predictive Control Part I - Introduction," 2014 (TSLAGVV000121449)
Popovic, Z., Soloviev, A., Mochizuki, Y. "Multi-Sensor System for Vehicle Positioning in Dense Urban Areas." SAE International, April 2011 (TSLAGVV000121560)
Ouyang, W., Wang, X., Zeng, X., Qiu, S., Luo, P., Tian, Y., Li, H., Yang, S., Wang, Z., Loy, C., Tang, X., "DeepID-Net: Deformable Deep Convolutional Neural Networks for Object Detection, Computer Vision Foundation, 2015 (TSLAGVV000121595)

Sill, J., Ayalew, B., "On the Frequency Domain Analysis of Tire Relaxation Effects on Transient On-Center Vehicle Handling Performance," Proceedings of the ASME 2009 International Mechanical Engineering Congress & Exposition, November 2009 (TSLAGVV000121389)
Carvahalo, A., Gao, Y., Gray, A., Tseng, H. E., Borrelli, F., "Predictive Controlo f an Autonomous Ground Vehicle using an Iterative Linearization Approach," Proceedings of the 16th International IEEE Annual Conference on Intelligent Transportation Systems (ITSC 2013), October 2013 (TSLAGVV000121397)
Borrelli, F., Jones, C., Morari, M., "Model Predictive Control Algorithm, Feasibility and Stability," 2014 (TSLAGVV000121411)
Gold, C., Dambok, D., Lorenz, L., Bengler, K., "'Take over!' How long does it take to get the driver back into the loop?," Proceedings of the Human Factors and Ergonomics Society, 2013 (TSLAGVV000139486)
Radlmayr, J., Gold, C., Lorenz, L., Farid, M., Bengler, K., "How Traffic Situations and Non-Driving Related Tasks Affect the Take-Over Quality in Highly Automated Driving," Proceedings of the Human Factors and Ergonomics Society, 2014 (TSLAGVV000139443)
Shen, S., Neyens, D., "Assessing drivers' performance when automated driver support systems fail with different levels of automation," Proceedings of the Human Factors and Ergonomics Society 58th Annual Meeting, 2014 (TSLAGVV000139474)
U.S. Patent Application Publication No. 2007/0219720 (TSLAGVV000122440)
Gereon Meyer and Sven Beiker. Road Vehicle Automation. Springer. 2014. (TSLAGVV000122478)
Jeff Wit et al. "Autonomous Ground Vehicle Path Tracking." Journal of Robotic Systems 21(8), 439-449 (2004). (TSLAGVV000122738)
Keshav Bimbraw. "Autonomous Cars: Past, Present and Future." Proceedings of the 12th International Conference on Informatics in Control, Automation and Robotics (ICINCO-2015), pages 191- 198, July 21-23, 2015. (TSLAGVV000122749)
Xavier Mosquet et al. Revolution in the Driver's Seat. The Boston Consulting Group. April 2015. (TSLAGVV000122757)
Steven E. Muldoon et al. "10.3: Vehicle Fault Diagnostics Using a Sensor Fusion Approach." IEEE 2002.(TSLAGVV000122787)
U.S. Patent No. 8,825,258 (TSLAGVV000122793)
U.S. Patent No. 9,798,323 (TSLAGVV000122815)
U.S. Patent No. 9,884,631 (TSLAGVV000122823)
U.S. Patent No. 9,483,059 (TSLAGVV000122841)
International Publication No. WO 2006/047297 (TSLAGVV000122874)
Rajesh Rajamani et al. "A Complete Fault Diagnostic System for Automated Vehicles Operating in a Platoon." IEEE Transactions on Control Systems Technology, Vol 9, No. 4, July 2001. (TSLAGVV000122936)
U.S. Patent Application Publication No. 2013/0063336 (TSLAGVV000122948)
Matthew McNaughton et al. "Motion Planning for Autonomous Driving with a Conformal Spatiotemporal Lattice." 2011 IEEE International Conference on Robotics and Automation. May 9-13, 2011, Shanghai, China. (TSLAGVV000122959)
A. de la Escalera. "Traffic sign recognition and analysis for intelligent vehicles." Image and Vision Computing 21 (2003) 247-258. (TSLAGVV000122966)

U.S. Patent No. 8,378,849 (TSLAGVV000122990)
U.S. Patent No. 5,779,593 (TSLAGVV000122999)
U.S. Patent Application Publication No. 2013/0131907 (TSLAGVV000135816)
Harding, J., Powell, G., R., Yoon, R., Fikentscher, J., Doyle, C., Sade, D., Lukuc, M., Simons, J., & Wang, J. (2014, August). "Vehicle-to-vehicle communications: Readiness of V2V technology for application." (Report No. DOT HS 812 014). Washington, DC: National Highway Traffic Safety Administration. (TSLAGVV000123013)
U.S. Patent No. 9,950,740 (TSLAGVV000123340)
Dannheim, C., Icking, C., Mäder, M., & Sallis, P. (2014, May). Weather detection in vehicles by means of camera and LIDAR systems. In 2014 Sixth International Conference on Computational Intelligence, Communication Systems and Networks (pp. 186-191). IEEE. (TSLAGVV000123368)
U.S. Patent Application Publication No. 2016/0107655 to Desnoyer et al. (TSLAGVV000139513)
California Vehicle Code 22108. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH&sectionNum=22108. Enacted by Stats. 1959, Ch. 3. (TSLAGVV000139434)
"Mercedes-Benz previews next-generation intelligent safety and driver assistance systems; sensor fusion," Green Car Congress, November 28, 2012. (TSLAGVV000139435)
Lingyun Xiao & Feng Gao (2010) "A comprehensive review of the development of adaptive cruise control systems," Vehicle System Dynamics, 48:10, 1167-1192, DOI: 10.1080/00423110903365910 ("Xiao") (TSLAGVV000139561)
"Removal of the Overtake user switch," January 25, 2015 (TSLAGVV000124677)

Tesla further incorporates by reference all references cited in the Asserted Patents, including any references raised during prosecution of the Asserted Patents.

To the extent any of the above patents, patent applications or publications incorporate by reference any other patents, patent applications, or publications, Tesla reserves the right to rely on those patents, patent applications or publications. In addition, to the extent that any of the above patents, patent applications or publications were disclosed in earlier published patents, patent applications or publications, then Tesla reserves the right to rely on those earlier published patents, patent applications or publications.

In addition to the above references, Defendant identifies the below systems as prior art under 35 U.S.C. §§ 102 and/or 103. As noted above, each of the identified systems may also serve to show the state of the art relevant to the Asserted Patents and Defendant reserves the right to rely on them as well as other prior art known to a POSA that may not be identified herein for that purpose:

Infiniti Q50 Active Lane Control, which was on sale or publicly available or used at least as early as October 24, 2013. Among other evidence, the following documents and things describe this system:

- Infiniti Q50 Owner's Manual, Nissan, 2014, https://ownersmanuals2.com/d/35262/infiniti-q50-2014-owners-manual (TSLAGVV000139592)
- "2014 Infiniti Q50S Test: Weird Steer with an Angry Leer," caranddriver.com, October 24, 2013, https://www.caranddriver.com/reviews/a15111112/2014-infiniti-q50s-test-review/ (TSLAGVV000139403)

Nissan Digital Control Assist and Driver Assistance System, which was on sale or publicly available or used at least as early as July 21, 2009. Among other evidence, the following documents and things describe this system:

- https://global.nissannews.com/en/releases/090722-02-e:.
- "New driver-assist systems from Nissan help straighten out curvy roads," newatlas.com, https://newatlas.com/nissan-assisted-steering/12387/ (TSLAGVV000139462)
- "Navigation-cooperative Distance Control Assist," Nissan Motor Corporation, https://www.nissan-

global.com/EN/INNOVATION/TECHNOLOGY/ARCHIVE/NDCA/ (TSLAGVV000139460)

Audi Q7 Driver Assistance System, which was on sale or publicly available or used at least as early as May 7, 2015. Among other evidence, the following documents and things describe this system:

- "Audi Q7 - Animation predictive efficiency assistant," Audi Media Center, https://www.audi-mediacenter.com/en/videos/video/audi-q7-animation-predictive-efficiency-assistant-2589 (TSLAGVV000139417; TSLAGVV000139589)
- "Audi Q7 predictive efficiency assistant," Audi Technology Portal, https://www.audi-technology-portal.de/en/electrics-electronics/driver-assistant-systems/audi-q7-predictive-efficiency-assistant (TSLAGVV000139419; TSLAGVV000139590)

Stanford Autonomous Driving Team vehicles, which was publicly available or used at least as early as 2005. Among other evidence, the following documents and things describe this system:

- "Stanley," Stanford Racing Team, https://cs.stanford.edu/group/roadrunner/stanley.html (TSLAGVV000139485)
- "Welcome," Stanford Autonomous Driving Team," http://driving.stanford.edu/index.html (TSLAGVV000139482)
- "Stanford Driving Software Files," SourceForge.com, https://sourceforge.net/projects/stanforddriving/files/ (TSLAGVV000139483)
- "Publications," Stanford Autonomous Driving Team, http://driving.stanford.edu/papers.html (TSLAGVV000139479)

Rivium GRT, which was on sale, publicly available or used at least as early as 2004. Among other evidence, the following documents and things describe this system:

- "Rivium 2.0" 2getthere.eu, https://www.2getthere.eu/projects/rivium/rivium-2-0/ (TSLAGVV000139407)
- "Operational Rivium GRT System – Connexxion," December 31, 2014, https://www.youtube.com/watch?v=WlAHXcQHWpU (TSLAGVV000139471)

B. Level of Skill of a Person of Ordinary Skill in the Art

A POSA at the time of the Asserted Patents would have had a bachelor's degree in computer engineering, computer science, electrical engineering, mechanical engineering, physics, or a related field, with at least four years of experience in the field of vehicle telematics and safety systems, or a master's degree in the same fields with at least three years of experience in the field of vehicle telematics and safety systems. Additional education or experience might substitute for the above requirements.

C. Anticipation (35 U.S.C. § 102)

Defendant contends that the prior art references and systems charted in the exhibits attached hereto and/or described herein below anticipate and/or render obvious, alone or in combination, one or more of the Asserted Claims. Furthermore, Defendant reserves the right to rely on any of the charted prior art references together with any of the below references to show the state of the art and the knowledge of one of ordinary skill in the art at the times of the alleged inventions of the Asserted Patents.

1. Anticipation of the Asserted Claims of the '402 Patent

Some or all of the Asserted Claims of the '402 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references or systems identified in the claim charts included in Exhibits A-1 through A-35, which identify specific examples of where each limitation

of the Asserted Claims is found in the prior art references or systems. As explained above, the cited portions of prior art references or documents relating to systems identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art, and should be understood in the context of the reference or system as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references and systems as anticipating one or more of the Asserted Claims of '402 patent under 35 U.S.C. § 102. The tables of anticipating references and systems below are exemplary, and they do not constitute an admission that any reference or system not listed below does not also anticipate the claims of the '402 patent. Further, Defendant contends that any prior art reference or document relating to a system in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
A-1	U.S. Patent No. 9,406,177 ("Attard")	August 2, 2016
A-2	U.S. Patent No. 8,618,922 ("Debouk")	December 31, 2013
A-3	U.S. Patent No. 11,175,660 ("Fields")	November 16, 2021
A-4	U.S. Patent No. US 9,751,534 ("Fung")	September 5, 2017
A-5	U.S. Patent Application Publication No. 2016/0267335 ("Hampiholi")	September 15, 2016
A-6	U.S. Patent No. 10,185,998 ("Konrardy")	January 22, 2019
A-7	U.S. Patent No. 9,063,543 Kyoung-Hwan ("An")	June 23, 2015
A-8	U.S. Patent No. 10,377,303 ("McNew ")	August 13, 2019
A-9	U.S. Patent Application Publication No. 2016/0252903 ("Prokhorov")	September 1, 2016

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
A-10	U.S. Patent Application Publication No. 2015/0314780 ("Stenneth")	November 5, 2015
A-11	U.S. Patent No. 9,494,926 ("Frazer")	November 15, 2016
A-12	U.S. Patent No. 11,040,725 ("Scofield")	June 22, 2021
A-13	U.S. Patent No. 9,430,944 ("Grimm")	August 30, 2016
A-14	U.S. Patent No. 8,874,305 ("Dolgov")	October 28, 2014
A-15	U.S. Patent Application Publication No. 2014/0336935 ("Zhu")	November 13, 2014
A-16	U.S. Patent No. 9,688,145 ("Kang")	June 27, 2017
A-17	U.S. Patent No. 9,451,030 ("Schunder")	September 20, 2016
A-18	U.S. Patent No. 9,714,037 ("DeRuyck")	July 25, 2017
A-19	U.S. Patent Application Publication No. 2007/0268158 ("Gunderson")	November 22, 2007
A-20	U.S. Patent No. 9,242,647 ("Tsimhoni")	January 26,2016
A-21	U.S. Patent No. 10,139,824 ("Sako")	November 27, 2018
A-22	U.S. Patent No. 10,086,844 ("Coelingh")	October 2, 2018
A-23	U.S. Patent No. 9,475,491 ("Nagasaka")	October 25, 2016
A-24	U.S. Patent No. 8,305,444 ("Hada")	November 6, 2012
A-25	U.S. Patent Application Publication No. 2012/0303258 ("Pampus")	November 26, 2012
A-26	U.S. Patent Application Publication No. 2015/0158495 ("Duncan")	January 11, 2015
A-27	U.S. Patent No. 9,159,301 ("Yamada")	October 13, 2015
A-28	U.S. Patent Application Publication No. 2015/0166069 ("Engelman")	January 18, 2015
A-29	U.S. Patent No. 9,604,652 ("Strauss")	March 28, 2017

Exhibit	System
A-30	Tesla Autopilot on Hardware 1 ("Autopilot HW1")
A-31	Waymo's Automated Driving System ("Waymo")

Exhibit	System
A-32	Mobileye Autonomous Technology ("Mobileye"),
A-33	Subaru Vehicles with EyeSight ("Subaru EyeSight")
A-34	Mercedes Driver Assistance ("Mercedes")
A-35	Carnegie Mellon University's Autonomous Driving System ("CMU System")

To the extent any item of prior art or system cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '402 patent, Defendant reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art.

2. Anticipation of the Asserted Claims of the '765 Patent

Some or all of the Asserted Claims of the '765 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references or systems identified in the claim charts included in Exhibits B-1 through B-35, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references or systems. As explained above, the cited portions of prior art references or documents relating to systems identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art, and should be understood in the context of the reference or system as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references and systems as anticipating one or more of the Asserted Claims of '765 patent under 35 U.S.C. § 102. The tables of anticipating references and systems below are exemplary, and they do not constitute an admission that any reference or system not listed below does not also anticipate the claims of the '765 patent. Further, Defendant contends that any prior art reference or document relating to a system in the attached charts that is

charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
B-1	U.S. Patent No. 9,406,177 ("Attard")	August 2, 2016
B-2	U.S. Patent No. 8,618,922 ("Debouk")	December 31, 2013
B-3	U.S. Patent No. 11,175,660 ("Fields")	November 16, 2021
B-4	U.S. Patent No. US 9,751,534 ("Fung")	September 5, 2017
B-5	U.S. Patent Application Publication No. 2016/0267335 ("Hampiholi")	September 15, 2016
B-6	U.S. Patent No. 10,185,998 ("Konrardy")	January 22, 2019
B-7	U.S. Patent No. 9,063,543 Kyoung-Hwan ("An")	June 23, 2015
B-8	U.S. Patent No. 10,377,303 ("McNew ")	August 13, 2019
B-9	U.S. Patent Application Publication No. 2016/0252903 ("Prokhorov")	September 1, 2016
B-10	U.S. Patent Application Publication No. 2015/0314780 ("Stenneth")	November 5, 2015
B-11	U.S. Patent No. 9,494,926 ("Frazer")	November 15, 2016
B-12	U.S. Patent No. 11,040,725 ("Scofield")	June 22, 2021
B-13	U.S. Patent No. 9,430,944 ("Grimm")	August 30, 2016
B-14	U.S. Patent No. 8,874,305 ("Dolgov")	October 28, 2014
B-15	U.S. Patent Application Publication No. 2014/0336935 ("Zhu")	November 13, 2014
B-16	U.S. Patent No. 9,688,145 ("Kang")	June 27, 2017
B-17	U.S. Patent No. 9,451,030 ("Schunder")	September 20, 2016

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
B-18	U.S. Patent No. 9,714,037 ("DeRuyck")	July 25, 2017
B-19	U.S. Patent Application Publication No. 2007/0268158 ("Gunderson")	November 22, 2007
B-20	U.S. Patent No. 9,242,647 ("Tsimhoni")	January 26,2016
B-21	U.S. Patent No. 10,139,824 ("Sako")	November 27, 2018
B-22	U.S. Patent No. 10,086,844 ("Coelingh")	October 2, 2018
B-23	U.S. Patent No. 9,475,491 ("Nagasaka")	October 25, 2016
B-24	U.S. Patent No. 8,305,444 ("Hada")	November 6, 2012
B-25	U.S. Patent Application Publication No. 2012/0303258 ("Pampus")	November 26, 2012
B-26	U.S. Patent Application Publication No. 2015/0158495 ("Duncan")	January 11, 2015
B-27	U.S. Patent No. 9,159,301 ("Yamada")	October 13, 2015
B-28	U.S. Patent Application Publication No. 2015/0166069 ("Engelman")	January 18, 2015
B-29	U.S. Patent No. 9,604,652 ("Strauss")	March 28, 2017

Exhibit	System
B-30	Tesla Autopilot on Hardware 1 ("Autopilot HW1")
B-31	Waymo's Automated Driving System ("Waymo")
B-32	Mobileye Autonomous Technology ("Mobileye"),
B-33	Subaru Vehicles with EyeSight ("Subaru EyeSight")
B-34	Mercedes Driver Assistance ("Mercedes")
B-35	Carnegie Mellon University's Autonomous Driving System ("CMU System")

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the ’765 patent, Defendant reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art.

3. Anticipation of the Asserted Claims of the ’004 Patent

Some or all of the Asserted Claims of the ’004 patent are invalid as anticipated under 35 U.S.C. § 102 in view of each of the prior art references or systems identified in the claim charts included in Exhibits C-1 through C-35, which identify specific examples of where each limitation of the Asserted Claims is found in the prior art references or systems. As explained above, the cited portions of prior art references or documents relating to systems identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art, and should be understood in the context of the reference or system as a whole and as they would be understood by a person of ordinary skill in the art.

Defendant identifies the following references and systems as anticipating one or more of the Asserted Claims of ’004 patent under 35 U.S.C. § 102. The tables of anticipating references and systems below are exemplary, and they do not constitute an admission that any reference or system not listed below does not also anticipate the claims of the ’004 patent. Further, Defendant contends that any prior art reference or document relating to a system in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
C-1	U.S. Patent No. 9,406,177 (“Attard”)	August 2, 2016
C-2	U.S. Patent No. 8,618,922 (“Debouk”)	December 31, 2013

Exhibit	Patent No. or Title (Primary Inventor/Author)	Date of Issuance or Publication
C-3	U.S. Patent No. 11,175,660 ("Fields")	November 16, 2021
C-4	U.S. Patent No. US 9,751,534 ("Fung")	September 5, 2017
C-5	U.S. Patent Application Publication No. 2016/0267335 ("Hampiholi")	September 15, 2016
C-6	U.S. Patent No. 10,185,998 ("Konrardy")	January 22, 2019
C-7	U.S. Patent No. 9,063,543 Kyoung-Hwan ("An")	June 23, 2015
C-8	U.S. Patent No. 10,377,303 ("McNew ")	August 13, 2019
C-9	U.S. Patent Application Publication No. 2016/0252903 ("Prokhorov")	September 1, 2016
C-10	U.S. Patent Application Publication No. 2015/0314780 ("Stenneth")	November 5, 2015
C-11	U.S. Patent No. 9,494,926 ("Frazer")	November 15, 2016
C-12	U.S. Patent No. 11,040,725 ("Scofield")	June 22, 2021
C-13	U.S. Patent No. 9,430,944 ("Grimm")	August 30, 2016
C-14	U.S. Patent No. 8,874,305 ("Dolgov")	October 28, 2014
C-15	U.S. Patent Application Publication No. 2014/0336935 ("Zhu")	November 13, 2014
C-16	U.S. Patent No. 9,688,145 ("Kang")	June 27, 2017
C-17	U.S. Patent No. 9,451,030 ("Schunder")	September 20, 2016
C-18	U.S. Patent No. 9,714,037 ("DeRuyck")	July 25, 2017
C-19	U.S. Patent Application Publication No. 2007/0268158 ("Gunderson")	November 22, 2007
C-20	U.S. Patent No. 9,242,647 ("Tsimhoni")	January 26,2016
C-21	U.S. Patent No. 10,139,824 ("Sako")	November 27, 2018
C-22	U.S. Patent No. 10,086,844 ("Coelingh")	October 2, 2018
C-23	U.S. Patent No. 9,475,491 ("Nagasaka")	October 25, 2016
C-24	U.S. Patent No. 8,305,444 ("Hada")	November 6, 2012
C-25	U.S. Patent Application Publication No. 2012/0303258 ("Pampus")	November 26, 2012
C-26	U.S. Patent Application Publication No. 2015/0158495 ("Duncan")	January 11, 2015
C-27	U.S. Patent No. 9,159,301 ("Yamada")	October 13, 2015
C-28	U.S. Patent Application Publication No. 2015/0166069 ("Engelman")	January 18, 2015
C-29	U.S. Patent No. 9,604,652 ("Strauss")	March 28, 2017

Exhibit	System
C-30	Tesla Autopilot on Hardware 1 ("Autopilot HW1")
C-31	Waymo's Automated Driving System ("Waymo")
C-32	Mobileye Autonomous Technology ("Mobileye"),
C-33	Subaru Vehicles with EyeSight ("Subaru EyeSight")
C-34	Mercedes Driver Assistance ("Mercedes")
C-35	Carnegie Mellon University's Autonomous Driving System ("CMU System")

To the extent any item of prior art cited above is deemed not to disclose, explicitly or inherently, any limitation of an asserted claim of the '004 patent, Defendant reserves the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art.

D. Obviousness (35 U.S.C. § 103)

The U.S. Supreme Court has provided guidance on the obviousness inquiry. In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966), the Supreme Court set out four items to be considered in the obviousness analysis: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the art; and (4) secondary considerations, such as commercial success. Exemplary circumstances that may render claims obvious include when "a person of ordinary skill can implement a predictable variation"; when "a technique has been used to improve one device, and a person ordinary skill in the art would recognize that it would improve similar devices in the same way"; or that a solution was "obvious to try," such as "[w]hen there is a design need or market pressure to solve a problem and

there are a finite number of identified, predictable solutions." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417, 421 (2007).

But a claimed invention is not obvious merely because all claim limitations are known in the prior art—there must be a motivation to modify or combine the disclosures of multiple references. *See, e.g.*, *Forest Labs., LLC v. Sigmapharm Labs., LLC*, 918 F.3d 928, 934 (Fed. Cir. 2019) ("An invention is not obvious simply because all of the claimed limitations were known in the prior art at the time of the invention. Instead, we ask 'whether there is a reason, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the references, and that would also suggest a reasonable likelihood of success.'") (citation omitted). The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007), counseled an "an expansive and flexible approach" to that inquiry. The Court explained as follows:

> The obviousness analysis cannot be confined by . . . overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends.

Id. at 419. Indeed, the Supreme Court has stated that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton," and cautioned against implementing a "constricted analysis" that deviates from "common sense." *Id.* at 420–21.

Consistent with the "expansive and flexible approach," an obviousness inquiry looks to various factors that may have led a POSA to the claimed invention. The Federal Circuit has explained that there is no rigid requirement for the prior art to teach every limitation, explaining that "a claimed invention may be obvious even when the prior art does not teach each claim limitation, so long as the record contains some reason why one of skill in the art would modify the prior art to obtain the claimed invention." *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir.

2016), *overruled on other grounds by Aqua Prod., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017). The Federal Circuit has also explained that the motivation to modify or combine may be explicit, *e.g.*, *Optivus Tech., Inc. v. Ion Beam Applications S.A.*, 469 F.3d 978, 990–91 (Fed. Cir. 2006), or implicit, *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006). The motivation to combine may come from "common sense," *e.g.*, *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 918 F.3d 928, 1331 (Fed. Cir. 2009), or from the "general knowledge" of a POSA, *see Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1338 (2020). In addition, there is no need to show that there was a known problem with the prior art. *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1003 (Fed. Cir. 2016). And the evidence supporting a motivation to combine need not itself be prior art. *See Nat'l Steel Car, Ltd. V. Canadian Pac. Ry., Ltd.*, 357 F.3d 1319, 1337–39 (Fed. Cir. 2004).

1. Obviousness of the Asserted Claims of the '402 Patent

To the extent that any asserted claim is not found to be anticipated by the prior art, such claims would have been obvious to a POSA at the time of the alleged invention of the '402 patent, as set forth below and specifically within Exhibits A-1 through A-35.

It would have been obvious to form the combinations set forth in the '402 IPR Petition for all the reasons stated therein, including the accompanying expert declaration.

It would have been obvious to a POSA at the time of the alleged invention of the '402 patent to (i) modify a prior art reference or system to include any allegedly missing limitations recited in the Asserted Claims and/or (ii) combine prior art references or systems, including with a POSA's general knowledge. Exhibits A-1 through A-35 identify exemplary prior art references and systems that either alone, or in combination with other prior art and/or a POSA's general knowledge, render the '402 patent Asserted Claims obvious under 35 U.S.C. § 103. In certain instances, the suggested obviousness combinations are provided in the alternative to Defendant's

anticipation contentions and do not suggest that any reference included in the combinations is not by itself anticipatory or does noy by itself render the asserted claim obvious (e.g., in view of the teachings contained within the prior art reference and/or combined with the general knowledge of a POSA).

To the extent Plaintiff challenges any of these references or combinations as failing to disclose or render obvious one or more elements of the Asserted Claims of the '402 patent, Defendant reserves the right to supplement these Invalidity Contentions to address that challenge.

A POSA would have been motivated to combine or modify the prior art references and systems identified in Exhibits A-1 through A-35, in view of the teachings of the prior art and/or the common sense and general knowledge of a POSA at the time of invention.

A POSA would have been motivated to combine each of *Attard*, *Hampiholi*, *Schunder*, *Grimm*, *Scofield*, *Fung*, *Prokhorov*, *Fields*, *Waymo*, *Konrardy*, *Autopilot HW1*, and *Stenneth* with each other or with any combination of *Debouk, Frazer*, *An*, *McNew*, *Dolgov*, *Zhu, Kang*, *DeRuyck, Gunderson*, *Tsimhoni*, *Sako*, *Coelingh*, *Nagasaka*, *Hada*, *Pampus*, *Duncan*, *Yamada*, *Engelman*, *Strauss*, *Mercedes*, *Subaru Eyesight*, *Mobileye*, and *CMU System* to make use of a "sensor system," including a "GPS sensor" and/or a sensor for "weather conditions" on the roadway where a vehicle is traveling as recited in claims 4, 9, 10, 11, 13. Vehicles have long had sensors of all types (e.g., tire pressure, oil, brakes) and autonomous or semi-autonomous functionality naturally requires additional sensor systems to provide feedback ensuring the correct and safe operation of vehicle systems. In particular, the inclusion of GPS provides enhanced accuracy, and the sensing of current weather conditions (e.g., via a camera) provides current feedback for vehicle systems that impact safety. For example, *Konrardy* teaches "the onboard computer 114 may include additional sensors, such as the GPS unit 206." *Konrardy*, 21:18-19. *Stenneth* teaches "[t]he sensors may

include global positioning system (GPS)." *Stenneth*, 5:25. *Prokhorov* teaches that "the sensor system 125 can include one or more sensors configured to detect, determine, assess, measure, quantify and/or sense the location of the vehicle 100" and that the system "can include a global positioning system." *Prokhorov*, [0049], [0075]. *Fields* teaches "[t]he on-board computer 114 may interface with the one or more sensors 120 within the vehicle 108 (e.g., an ignition sensor, an odometer, a system clock, a speedometer, a tachometer, an accelerometer, a gyroscope, a compass, a geolocation unit, a camera, a distance sensor, etc.)." *Fields*, 9:25-30. *Fung* teaches "in one embodiment, the vehicle [] comprises . . . a GPS." *Fung*, 67:60-64. *Waymo* teaches "[w]hat that on-board computer does first is integrate the sensor data. It takes the data from the laser and the cameras and integrates them into a view of the world, which it then uses to orient itself (with rough guidance of GPS) in virtual Mountain View." Ex. A-31 *Waymo* at Claim 9(h). *Hampiholi* teaches "weather condition information as determined from a weather sensor may be used to determine the driving conditions." *Hampiholi*, [0063]. *Grimm* teaches determining hazardous driving conditions caused by weather (e.g. wet/icy roads) using "data provided by participative sensing system vehicles." *Grimm*, 7:54-8:6. *See also* Ex. A-1 *Attard*, Ex. A-17 *Schunder*, Ex. A-30 *Autopilot HW1*, Ex. A-31 *Waymo*, Ex. A-5 *Hampiholi*, Ex. A-13 *Grimm*, Ex. A-4 *Fung,* Ex. A-9 *Prokhorov*, Ex. A-3 *Fields*, Ex. A-6 *Konrardy*, Ex. A-10 *Stenneth* and A-12 *Scofield* at Claim 9(f), 10(a). Such combinations involve nothing more than the use of a known technique (e.g., sensors in general and GPS and cameras in particular) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., sensors, including cameras, and GPS) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, McNew, Debouk, Fung, Mercedes, Fields, Autopilot HW1,* and *CMU System* with each other or with any combination of

Hampiholi, Frazer, An, Scofield, Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Prokhorov, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Subaru Eyesight, Mobileye, *Waymo*, *Konrardy*, and *Stenneth* to make use of sensors, such as "steering mechanism sensors," that detect the driver's physical state, as recited in claims 6 and 8. As noted above, vehicles have long had sensors of all types (e.g., tire pressure, oil, brakes) and autonomous or semi-autonomous functionality naturally requires additional sensor systems to provide feedback ensuring the correct and safe operation of vehicle systems. Because best practices and standards required the driver to maintain control of a vehicle, even when operating semi-autonomously, a POSA would have been motivated to include a steering wheel sensor that can detect the driver's state. For example, *Debouk* teaches subsystems that "monitor conditions of the vehicle including, but not limited to…operator torque requests, steering wheel input, and fuel consumption that may affect the controllability of the vehicle, and/or limit the use of, operating the vehicle in LAAD." *Debouk*, 17:50-55. *Fields* teaches that "[t]he vehicle operator may pause, terminate, and/or disable the autonomous operation feature…such as by turning a steering instrument." *Fields*, 18:1-10. *Fung* teaches "the steering wheel can include sensors (e.g., capacitive sensors, electrodes) mounted in or on the steering wheel." *Fung*, 58:41-45. *Mercedes* teaches a steering sensor "coupled to smart software that uses 70 parameters to establish a unique driver profile during the first 20 minutes of driving." *Mercedes Press Release* at 1. *See also* Ex. A-2 *Debouk,* Ex. A-4 *Fung*, Ex. A-34 *Mercedes*, Ex. A-3 *Fields*, Ex. A-1 *Attard*, A-8 *McNew*, Ex. A-30 *Autopilot HW1*, Ex. A-35 *CMU System* at Claim 4(b), 6(b), 9(b). Such combinations involve nothing more than the use of a known technique (e.g., using steering wheel torsion sensors to detect a driver's state) to improve automobiles/passenger vehicles in the same way. Such combinations

are nothing more than combinations of prior art elements (e.g., steering wheel sensors) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, Hampiholi, Frazer, An, McNew, Fields, Prokhorov, Scofield, Coelingh*, *Autopilot HW1, Debouk,* and *Konrardy* with each other or with any combination of *Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru, Mobileye, CMU System*, *Waymo*, *Fung*, and *Stenneth* to determine whether there is a "vehicle fault" and, if so, whether the fault exceeds a "threshold," including relying on "weighted voting" and "active learning data" to make that determination, as recited in claims 4, 9, 10, 11, and 13. The detection of faults is critical for any complex system, such as a vehicle, to maintain system integrity and operational readiness and identify problems. A POSA would further have been motivated to look for faults that exceed certain thresholds as a way of calibrating the complex system and avoiding distracting a driver or disabling a system unnecessarily. A POSA also would have been motivated to make use of "weighted voting" for this as a way of calibrating competing signals/information in a complex system and ultimately avoiding unnecessary distracting a driver or disabling a system unnecessarily. In addition, a POSA would have been motivated to make use of learning data from a wide variety of vehicle fleets and in a variety of conditions to provide the best possible information for the vehicle to rely. For example, *Debouk* teaches that "internal faults (or the possibility thereof) must be assessed by the monitoring of diagnostic conditions to determine the feasibility of performing such maneuvers when fault handling and degradation is employed. *Debouk*, 22:37-40. It also teaches that in the context of "determining one of a threatening failure, an urgent failure, a critical failure or expired limited-ability autonomous driving capabilities based on the monitored diagnostic conditions." *Debouk*, 25:47-50. Konrardy

teaches that "risk level may be compared against a plurality of predetermined warning thresholds, and the warning presented to the vehicle operator may be determined based upon the highest warning threshold exceeded by the risk level." *Konrardy*, 53:54-59. It also teaches "weighted risk levels" and that "communication data may include information from other autonomous vehicles." *Konrardy*, 50:18-20. *Prokhorov* teaches a "control weighting module 122 [that] can determine and/or assign weights in any suitable manner." *Prokhorov*, [0034]. *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Autopilot HW1* makes use of Kalman filters, which applies weights to prioritize more reliable data and minimize error; using additional weights in other contexts would have been obvious and routine. Ex. A-30 *Autopilot HW1* at Claim 8(c). *Frazer* teaches an action engine 110c including event table 112 for responding to faults in autonomous vehicles. *Frazer*, 21:20-32. *Hampiholi* teaches comparing a fault to several thresholds for determining appropriate responses. *Hampiholi,* [0056]-[0057], Fig. 4. *Attard* teaches weighting sensor data accuracy and determinations relative to external and/or environmental conditions such as precipitation or road conditions. *Attard*, 6:14-35. *See also* Ex. A-1 *Attard,* Ex. A-5 *Hampiholi,* Ex. A-11 *Frazer,* Ex. A-3 *Fields,* Ex. A-9 *Prokhorov,* Ex. A-2 *Debouk*, Ex. A-6 *Konrardy,* Ex. A-7 *An,* Ex. A-8 *McNew,* Ex. A-12 *Scofield,* and/or Ex. A-22 *Coelingh* at Claim 6(c), 8(c), 9(j). Such combinations involve nothing more than the use of a known technique (e.g., detecting faults in complex environments with competing signals) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., determining faults) according to known methods to yield predictable results. A POSA would have

specifically found it obvious to make use of "active learning data" in its various claimed forms in connection with *Autopilot HW1*, particularly as *Autopilot HW1* already included learning, data collection, telemetry, and backlisting functionality. *See, e.g.*, Ex. A-30, *Autopilot HW1* at Claim 14(a)(2). A POSA would have been motivated to modify this existing functionality to improve the safety and performance of the vehicle, and would have had a reasonable expectation of success in doing so because only modest software changes would have been required.

A POSA would have been motivated to combine each of *Attard, Hampiholi, McNew, Scofield, Grimm, Zhu, Coelingh, Subaru Eyesight, Autopilot HW1*, *Fields*, *Fung*, *Debouk*, *Konrardy*, and *Stenneth* with each other or with any combination of *Frazer, An, Dolgov, Kang, Schunder, Prokhorov, DeRuyck, Gunderson, Tsimhoni, Sako, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Mobileye, Waymo,* and *CMU System* to determine and implement a "corrective action," including by alerting the driver and/or transferring control to the driver or, instead, to make use of "the engine throttle," as recited in claims 4, 6, 8, 9, 11, and 13. As noted above, the detection of faults is critical for any complex system, such as a vehicle, to maintain system integrity and operational readiness and identify problems. A POSA would therefore have been motivated to take "corrective action" to address those faults, including by providing useful alerts to a driver in a semi-autonomous situation, such as the need to take over driving, in the interests of safety. Further, a POSA would have been motivated to store related information in a database, as a convenient and well-known way to maintain data that relates corrective actions with fault conditions; this is one of numerous possible design choices that would have been straight forward to implement. A POSA also would have been motivated to make use of "weighted voting" for this as a way of calibrating competing signals/information in a complex system and ultimately avoiding unnecessary distracting a driver or disabling a system

unnecessarily as a "corrective action." In addition, a POSA would have been motivated to make use of learning data from a wide variety of vehicle fleets and in a variety of conditions to provide the best possible information for the vehicle to rely. For example, *Debouk* teaches that "[t]he operator is warned and requested to take control of the vehicle." *Debouk*, 7:67-8:1. Fung teaches "the impact of response system 188 on each vehicle system is described as either 'control' type or 'warning' type. The control type indicates that the operation of a vehicle system is modified by the control system. The warning type indicates that the vehicle system is used to warn or otherwise alert a driver." *Fung*, 85:41-59. *Konrardy* teaches that "[w]here control of the vehicle 108 must be returned to the vehicle operator, the controller 204 may alert the vehicle operator in advance of returning to manual operation." *Konrardy*, 23:40-43. *Stenneth* teaches "the driving mode command transitions the autonomous vehicle to the manual mode, if applicable, when the vehicle confidence score does not exceed the confidence threshold." *Stenneth*, Abstract. *Autopilot HW1* makes use of Kalman filters, which applies weights to prioritize more reliable data and minimize error; using additional weights in other contexts would have been obvious and routine. Ex. A-30 *Autopilot HW1* at Claim 8(c). *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold . . . . For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. It also teaches that "[i]f the one or more risk levels meet or exceed the critical threshold, the on-board computer 114 may present an alert at block 720 and transfer control to the vehicle operator." *Fields*, 32:6-10. *Scofield* teaches pulling over, reducing the vehicle's speed to a stop, due to cows in the road. *Scofield*, 6:31-51. *Grimm* teaches slowing the vehicle and terminating cruise control in response to sensing an object in the road. *Grimm*, 4:57-5:4. *Subaru Eyesight* teaches performing pre-

collision throttle management when the selector level is placed in the wrong position and the accelerator is accidentally depressed. *Subaru EyeSight Manual* at 11-12. *See also* Ex. A-3 *Fields,* Ex. A-8 *McNew,* Ex. A-12 *Scofield,* Ex. A-13 *Grimm,* Ex. A-33 *Subaru Eyesight,* Ex. A-4 *Fung*, Ex. A-2 *Debouk*, Ex. A-6 *Konrardy*, Ex. A-10 *Stenneth,* Ex. A-1 *Attard,* Ex. A-5 *Hampiholi, McNew,* Ex. A-15 *Zhu,* and Ex. A-22 *Coelingh* at Claim 4(b), 8(e), 9(b). Such combinations involve nothing more than the use of a known technique (e.g., correcting fault conditions in complex environments with competing signals) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., identifying corrective actions for faults) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, An, Fields, Scofield, Debouk*, *Stenneth, Autopilot HW1*, and *CMU System* with each other or with any combination of *Hampiholi, Frazer, McNew, Fung, Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru Eyesight, Mobileye, Waymo*, *Prokhorov*, and *Konrardy* to determine a control processor "competence level" and/or the "operational state" of a vehicle, including by harnessing "active learning data" from other vehicles, as recited in claims 4, 6, 8, and 9. Determining states and competencies of vehicle systems, including processors, are critical for any complex system to maintain system integrity and operational readiness and identify and address problems. A POSA also would have been motivated to make use of "active learning" data from other vehicles as a way of interpreting and calibrating competing signals/information in a complex system and ultimately avoiding unnecessary distracting a driver or disabling a system unnecessarily. For example, *An* teaches calculating an "autonomous driving risk index" using weights. *An*, 5:54-6:24. *Scofield* teaches determining if a driving condition exceeds a complexity threshold for

autonomous driving. *Scofield*, 1:55-2:2. Fields teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Debouk* teaches "determining a critical failure having an immediate adverse effect on the ability of the system to continue operation in limited-ability autonomous driving." *Debouk*, 26:32-34. *Stenneth* teaches "[a] computing device calculat[ing] a vehicle confidence level based on at least one confidence factor" and that "[w]hen the vehicle confidence exceeds the confidence threshold, the computing device 122 determines that the conditions are suitable for autonomous driving." *Stenneth*, 1:44-45, 3:5-7. *See also* Ex. A-7 *An*, Ex. A-3 *Fields*, Ex. A-12 *Scofield*, Ex. A-2 *Debouk*, Ex. A-10 *Stenneth*, Ex. A-1 *Attard*, Ex. A-30 *Autopilot HW1*, and Ex. A-35 *CMU System* at Claim 4(h), 6(c), 9(c). Such combinations involve nothing more than the use of a known technique (e.g., detecting system state using known techniques) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., assessments of processor and system state) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Hampiholi, An, McNew, DeRuyck, Duncan, Mercedes, Autopilot HW1, Debouk*, *Fields*, *Fung*, *Konrardy*, and *Stenneth* with each other or with any combination of *Attard, Frazer, Scofield, Grimm, Dolgov, Zhu, Kang, Schunder, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Prokhorov, Hada, Pampus, Yamada, Engelman, Strauss, Subaru Eyesight, Mobileye, Waymo,* and *CMU System* to determine a "competence level of a human driver," using sensor readings, as recited in claims 4, 8, and 9. In an autonomous or semi-autonomous vehicle, a POSA would have been motivated to monitor and

assess the capabilities and competence of the driver in order to ensure safety of vehicle operations that depend on him or her. Indeed, industry standards at the time required this. *See* SAE J3016 at 2 (noting "the expectation that the *human driver* will respond appropriately to a *request to intervene*"); *id.* (noting "*Human Driver* monitors the driving environment" with the "expectation that the *human driver* perform all remaining aspects"); *Debouk*, 1:57-59 (explaining that "[k]nown methods detect the attentiveness of the operator and alert the driver that a response is required if an internal fault is detected."). A POSA would further have been motivated to make use of sensors, such as a steering wheel sensor discussed above, in order to make such determinations because of the need to ensure the driver is engaged. For example, *Debouk* teaches "determining one of an inattentive driver if the warning configured to re-gain the attention of the operator is unsuccessful." *Debouk*, 24:47-50. *Fung* teaches "monitoring information can include drowsiness information indicating whether a driver is in a normal state or a drowsy state . . . the drowsiness information could include a value indicating the level of drowsiness, for example on a scale of 1 to 10, with 1 being the least drowsy and 10 being the drowsiest." *Fung*, 155:9-22. *Konrardy* teaches that "[o]nce the risk levels associated with…manual operation…have been weighted by the expected use levels, the total risk level for the vehicle and operator may be determined." *Konrardy*, 39:24-27. *Stenneth* teaches that "[s]ome drivers (e.g., inexperienced drivers, young drivers, or accident prone drivers) may be assigned higher vehicle confidence scores so that the autonomous driving mode is more likely to be selected." *Stenneth*, 10:10-14. *Fields* teaches determining "whether it is safer for a human to drive the vehicle or for the vehicle to automatically drive itself based upon…the driver profile and/or driver behavior data associated with the specific driver." *Fields*, 33:28-34. *Hampiholi* teaches collecting sensor readings to determine a human driver's competence level as impacted by the severity rank of distraction being

experienced. *Hampiholi*, [0062], Fig. 5. *An* teaches tracking a driver's blinking or line-of-sight to determine dozing or inattentiveness. *An*, 2:46-65. *See also* Ex. A-5 *Hampiholi,* Ex. A-7 *An,* Ex. A-2 *Debouk*, Ex. A-3 *Fields*, Ex. A-4 *Fung*, Ex. A-6 *Konrardy*, Ex. A-10 *Stenneth*, Ex. A-8 *McNew, A*-18 *DeRuyck*, A-26 *Duncan,* Ex. A-30 *Autopilot HW1*, and A-34 *Mercedes* at Claim 4(i)-4(j), 6(a), 6(d)-6(e), 9(a)-9(b). Such combinations involve nothing more than the use of a known technique (e.g., assessing driver ability) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., assessments of driver competence) according to known methods to yield predictable results.

At a minimum, a POSA would have found each of the above arrangements obvious to try. In addition, a POSA would have recognized that various arrangements and techniques potentially offered certain advantages. Accordingly, a POSA would have been motivated to try and implement such configurations.

A POSA would have recognized the benefits of utilizing the foregoing features. At a minimum, the claimed configurations of the '402 patent in view of the prior art would be obvious to try because it amounts to a simple substitution or modification of the prior art with a known feature to achieve predictable results. To a POSA, this would be a simple matter of choosing a design.

Moreover, a POSA would have had a reasonable expectation that the combination or modification of the prior art would achieve its intended purpose. Such modifications would have been straightforward applications of known hardware and software, and would have required nothing more than the common sense of a skilled artisan to implement these known concepts and structures in other known image processing systems. Because these were known techniques, each modification to the prior art would thus be the substitution or addition of a well-known and widely

used feature or component for its standard functionality, and therefore would have been a relatively straightforward task within the skillset of a POSA.

2. Obviousness of the Asserted Claims of the ’765 Patent

To the extent that any asserted claim is not found to be anticipated by the prior art, such claims would have been obvious to a POSA at the time of the alleged invention of the ’765 patent, as set forth below and specifically within Exhibits B-1 through B-35.

It would have been obvious to form the combinations set forth in the ’765 IPR Petition for all the reasons stated therein, including the accompanying expert declaration.

It would have been obvious to a POSA at the time of the alleged invention of the ’765 patent to (i) modify a prior art reference or system to include any allegedly missing limitations recited in the Asserted Claims and/or (ii) combine prior art references or systems, including with a POSA’s general knowledge. Exhibits B-1 through B-35 identify exemplary prior art references and systems that either alone, or in combination with other prior art and/or a POSA’s general knowledge, render the ’765 patent Asserted Claims obvious under 35 U.S.C. § 103. In certain instances, the suggested obviousness combinations are provided in the alternative to Defendant’s anticipation contentions and do not suggest that any reference included in the combinations is not by itself anticipatory or does noy by itself render the asserted claim obvious (e.g., in view of the teachings contained within the prior art reference and/or combined with the general knowledge of a POSA).

To the extent Plaintiff challenges any of these references or combinations as failing to disclose or render obvious one or more elements of the Asserted Claims of the ’765 patent, Defendant reserves the right to supplement these Invalidity Contentions to address that challenge.

A POSA would have been motivated to combine or modify the prior art references and systems identified in Exhibits B-1 through B-35, in view of the teachings of the prior art and/or the common sense and general knowledge of a POSA at the time of invention.

A POSA would have been motivated to combine each of *Konrardy, Stenneth, Prokhorov, Fields, Fung, Attard*, *Hampiholi, McNew, An*, *Sako*, *Scofield, Dolgov, Zhu*, *Grimm*, *Yamada*, *Kang*, *Schunder*, *Gunderson*, *Autopilot HW1*, *Waymo*, and/or *Nagasaka* with each other or with any combination of *Debouk*, *Frazer, DeRuyck*, *Pampus*, *Tsimhoni*, *Coelingh*, *Hada*, *Duncan*, *Engelman*, *Strauss*, *Mobileye*, *Mercedes, CMU,* and *Subaru* to make use of a "sensor system" including a "GPS sensor" as recited in claims 1, 6, 8, and 17 to improve feedback to vehicle systems and take advantage of the accuracy that GPS affords. For example, *Konrardy* teaches "the onboard computer 114 may include additional sensors, such as the GPS unit 206." *Konrardy*, 21:18-19. *Stenneth* teaches "[t]he sensors may include global positioning system (GPS)." *Stenneth*, 5:25. *Prokhorov* teaches that "the sensor system 125 can include one or more sensors configured to detect, determine, assess, measure, quantify and/or sense the location of the vehicle 100" and that the system "can include a global positioning system." *Prokhorov*, [0049], [0075]. *Fields* teaches "[t]he on-board computer 114 may interface with the one or more sensors 120 within the vehicle 108 (e.g., an ignition sensor, an odometer, a system clock, a speedometer, a tachometer, an accelerometer, a gyroscope, a compass, a geolocation unit, a camera, a distance sensor, etc.)." *Fields*, 9:25-30. *Fung* teaches "in one embodiment, the vehicle [] comprises . . . a GPS." *Fung*, 67:60-64. *Attard* teaches data collectors including GPS equipment included in a vehicle. *Attard*, 4:1-17. *Hampiholi* teaches vehicle data outputs including "GPS sensors." *Hampiholi,* [0031]. *An* teaches monitoring reception error of a vehicle's GPS device. *An*, 6:25-35. *Waymo* teaches "[w]hat that on-board computer does first is integrate the sensor data. It takes

the data from the laser and the cameras and integrates them into a view of the world, which it then uses to orient itself (with rough guidance of GPS) in virtual Mountain View." Ex. B-31 *Waymo* at Claim 1(f). *See also* Ex. B-9 *Prokhorov,* Ex. B-3 *Fields,* Ex. B-4 *Fung,* Ex. B-1 *Attard*, Ex. B-5 *Hampiholi,* Ex. B-7 *An*, Ex. B-6 *Konrardy,* Ex. B-10 *Stenneth,* Ex. B-8 *McNew,* Ex. B-21 *Sako*, Ex. B-12 *Scofield,* Ex. B-14 *Dolgov,* Ex. B-15 *Zhu*, Ex. B-13 *Grimm*, Ex. B-27 *Yamada*, Ex. B-16 *Kang*, Ex. B-17 *Schunder*, Ex. B-19 *Gunderson*, Ex. B-30 *Autopilot HW1*, and/or Ex. B-23 *Nagasaka* at Claim 1(a), 1(f). Such combinations involve nothing more than the use of a known technique (e.g., sensors in general and GPS in particular) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., sensors, including cameras, and GPS) according to known methods to yield predictable results. A POSA would also have been motivated to include more than one camera, and would have found it obvious to do so, because of the well-known improvements to vision and processing that were possible, therefore improving safety and performance. Multi-sensor systems (e.g., camera and radar) as well as multi-camera systems were well known in the art and a POSA would have had a reasonable expectation of success in implementing it.

A POSA would have been motivated to combine each of *Attard, Hampiholi, Frazer, An, McNew, Scofield, Coelingh, Fields*, *Fung*, *Debouk, Autopilot HW1*, and *Konrardy* with each other or with any combination of *Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Nagasaka, Hada, Pampus, Prokhorov, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru, Mobileye, Waymo, CMU System*, and *Stenneth* to determine "whether a fault has occurred" or exceeded various "thresholds" and determining various types of "corrective actions," including by use of a "fault remediation table" or database, as recited in claims 1, 4, 6, 7, 8, 12, 14, 15, 16, 17, 19. The detection of faults and identifying corrective actions is critical for

any complex system, such as a vehicle, to maintain system integrity and operational readiness and identify and address problems. A POSA would further have been motivated to look for faults that exceed certain thresholds as a way of calibrating the complex system and avoiding distracting a driver or disabling a system unnecessarily. A POSA would also have been motivated in a semi-autonomous vehicle to provide useful alerts to a driver, including the need to take over systems, in the interests of safety. Further, a POSA would have been motivated to store related information in a fault-remediation table and/or database, as convenient ways to maintain data that relates corrective actions with fault conditions; these are two of numerous possible design choices that would have been straight forward to implement. For example, *Debouk* teaches that "internal faults (or the possibility thereof) must be assessed by the monitoring of diagnostic conditions to determine the feasibility of performing such maneuvers when fault handling and degradation is employed. *Debouk*, 22:37-40. It also teaches that in the context of "determining one of a threatening failure, an urgent failure, a critical failure or expired limited-ability autonomous driving capabilities based on the monitored diagnostic conditions." *Debouk*, 25:47-50. *Konrardy* teaches that "risk level may be compared against a plurality of predetermined warning thresholds, and the warning presented to the vehicle operator may be determined based upon the highest warning threshold exceeded by the risk level." *Konrardy*, 53:54-59. *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Fung* teaches "the response system [] can receive vehicle information directly from vehicle systems [] and analyze the vehicle information based on the thresholds of the failure detection system []." *Fung*, 155:23-40. *Frazer* teaches an action engine 110c including event

table 112 for responding to faults in autonomous vehicles. *Frazer*, 21:20-32. *Hampiholi* teaches comparing a fault to several thresholds for determining appropriate responses. *Hampiholi,* [0056]-[0057], Fig. 4. *See also* Ex. B-5 *Hampiholi,* Ex. B-11 *Frazer,* Ex. B-3 *Fields*, Ex. B-4 *Fung*, Ex. B-2 *Debouk,* Ex. B-30 *Autopilot HW1*, Ex. B-6 *Konrardy,* Ex. B-1 *Attard,* Ex. B-7 *An,* Ex. B-8 *McNew,* Ex. B-12 *Scofield,* and/or Ex. B-22 *Coelingh* at Claim 1(b)-1(d), 1(i). Such combinations involve nothing more than the use of a known technique (e.g., detecting faults and responding with corrective actions) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., sensors, vehicle software, and driver alerts) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, An, Fields, Prokhorov, Scofield, Debouk*, *Stenneth, Autopilot HW1*, and *CMU System* with each other or with any combination of *Hampiholi, Frazer, McNew, Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru Eyesight, Mobileye, Waymo*, *Fung*, and *Konrardy* to determine a control processor "competence level" and/or the "operational state" of a vehicle, including by harnessing "weighted voting" systems as well as using competence levels to determine a corrective action and assign control of a vehicle, as recited in claims 1, 3, 6, 7, 8, 11, 14, 16, 18, and 20. Determining states and competencies of vehicle systems, including processors, are critical for any complex system to maintain system integrity and operational readiness and identify and address problems. A POSA would further have been motivated to take corrective action based on these states, as a natural usage of the information. A POSA also would have been motivated to make use of "weighted voting" systems for this as a way of calibrating competing signals/information in a complex system and avoiding unnecessary distracting a driver or disabling

a system unnecessarily. A POSA would also have been motivated in a semi-autonomous vehicle to use this information as an important check when assigning control, to ensure safety. For example, *An* teaches calculating an "autonomous driving risk index" using weights. *An*, 5:54-6:24. *Scofield* teaches determining if a driving condition exceeds a complexity threshold for autonomous driving. *Scofield*, 1:55-2:2. *Debouk* teaches "determining a critical failure having an immediate adverse effect on the ability of the system to continue operation in limited-ability autonomous driving." *Debouk*, 26:32-34. *Autopilot HW1* makes use of Kalman filters, which applies weights to prioritize more reliable data and minimize error; using additional weights in other contexts would have been obvious and routine. Ex. B-30 *Autopilot HW1* at Claim 3(a). *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Prokhorov* teaches a "control weighting module 122 [that] can determine and/or assign weights in any suitable manner." Prokhorov, [0034]. *Stenneth* teaches "[a] computing device calculat[ing] a vehicle confidence level based on at least one confidence factor" and that "[w]hen the vehicle confidence exceeds the confidence threshold, the computing device 122 determines that the conditions are suitable for autonomous driving." *Stenneth*, 1:44-45, 3:5-7. *See also* Ex. B-7 *An,* Ex. B-3 *Fields,* Ex. B-9 *Prokhorov,* Ex. B-12 *Scofield,* Ex. B-2 *Debouk*, Ex. B-10 *Stenneth,* Ex. B-1 *Attard,* and B-35 *CMU System* at Claim 1(h), 3(a)-3(b)(1)/3(c). Such combinations involve nothing more than the use of a known technique (e.g., detecting faults and responding with corrective actions) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than

combinations of prior art elements (e.g., assessments of processor and system state) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Hampiholi, An, McNew, DeRuyck, Duncan, Mercedes, Fung, Fields, Debouk*, *Konrardy*, *Autopilot HW1,* and *Stenneth* with each other or with any combination of *Attard, Prokhorov, Frazer, Scofield, Grimm, Dolgov, Zhu, Kang, Schunder, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Yamada, Engelman, Strauss, Subaru Eyesight, Mobileye, Waymo,* and *CMU System* to determine a "competence level of a human driver," including those above/below a "threshold" and by harnessing "weighted voting" systems, as well as using competence levels to determine a corrective action, as recited in claims 5, 6, 7, 8, 10, 11, 12, 14, and 15. In an autonomous or semi-autonomous vehicle, a POSA would have been motivated to monitor and assess the capabilities and competence of the driver, and take corrective action based on it, in order to ensure safety of vehicle operations that depend on him or her. Indeed, industry standards at the time required this. *See* SAE J3016 at 2 (noting "the expectation that the *human driver* will respond appropriately to a *request to intervene*"); *id.* (noting "*Human Driver* monitors the driving environment" with the "expectation that the *human driver* perform all remaining aspects"); *Debouk*, 1:57-59 (explaining that "[k]nown methods detect the attentiveness of the operator and alert the driver that a response is required if an internal fault is detected."). A POSA would further have been motivated to implement thresholds to assess the driver's competence level as a way of calibrating the varying degrees of attentiveness and balancing the need for the driver's attention, so as to avoid undue disruption while maintaining safety. A POSA also would have been motivated to make use of "weighted voting" systems for this as a way of calibrating competing signals/information in a complex system and avoiding unduly disabling or reducing the autonomous functionality. For example, *Debouk* teaches

"determining one of an inattentive driver if the warning configured to re-gain the attention of the operator is unsuccessful." *Debouk*, 24:47-50. *Konrardy* teaches that "[o]nce the risk levels associated with…manual operation…have been weighted by the expected use levels, the total risk level for the vehicle and operator may be determined." *Konrardy*, 39:24-27. *Stenneth* teaches that "[s]ome drivers (e.g., inexperienced drivers, young drivers, or accident prone drivers) may be assigned higher vehicle confidence scores so that the autonomous driving mode is more likely to be selected." *Stenneth*, 10:10-14. *Fields* teaches determining "whether it is safer for a human to drive the vehicle or for the vehicle to automatically drive itself based upon…the driver profile and/or driver behavior data associated with the specific driver." *Fields*, 33:28-34. *Fung* teaches "monitoring information can include drowsiness information indicating whether a driver is in a normal state or a drowsy state . . . the drowsiness information could include a value indicating the level of drowsiness, for example on a scale of 1 to 10, with 1 being the least drowsy and 10 being the drowsiest." *Fung*, 155:9-22. *Autopilot HW1* makes use of Kalman filters, which applies weights to prioritize more reliable data and minimize error; using additional weights in other contexts would have been obvious and routine. Ex. B-30 *Autopilot HW1* at Claim 3(a) and 5(a). *Hampiholi* teaches collecting sensor readings to determine a human driver's competence level as impacted by the severity rank of distraction being experienced. *Hampiholi*, [0062], Fig. 5. *An* teaches tracking a driver's blinking or line-of-sight to determine dozing or inattentiveness. *An*, 2:46-65. *See also* Ex. B-5 *Hampiholi,* Ex. B-7 *An,* Ex. B-4 *Fung,* Ex. B-3 *Fields,* Ex. B-2 *Debouk*, Ex. B-6 *Konrardy*, Ex. B-10 *Stenneth,* Ex. B-8 *McNew,* Ex. B-30 *Autopilot HW1*, Ex. B-18 *DeRuyck*, Ex. B-26 *Duncan,* and Ex. B-34 *Mercedes* at Claim 5(a), 8(c), 10(a)-10(a)(3)/10(c), 11(c), 12(a). Such combinations involve nothing more than the use of a known technique (e.g., detecting faults and responding with corrective actions) to improve automobiles/passenger

vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., assessments of driver competence) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, Grimm, Schunder, Gunderson, Konrardy, Prokhorov,* and *CMU System* with each other or with any combination of *Hampiholi, Frazer, An, McNew, Scofield, Dolgov, Zhu, Kang, DeRuyck, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru Eyesight, Mobileye, Waymo, Debouk, Fields, Stenneth, Autopilot HW1,* and *Fung* to make use of a "weighted voting system" for sensor data or other "inputs" as well as making use of "active learning data" from a cohort of vehicles and under a variety of conditions, as recited in claims 3, 5, 8, 10, 13, 14, 18, and 20. Such a "weighted voting system" would provide a way to balance and calibrate competing signals and information from, e.g., sensors, thereby allowing the system to take appropriate action or refrain from action, resulting in improved safety and user experience. A POSA would further have been motivated to make use of learning data from a wide variety of vehicle fleets and in a variety of conditions to provide the best possible information for the vehicle to rely. For example, *Attard* teaches weighting sensor data accuracy and determinations relative to external and/or environmental conditions such as precipitation or road conditions. *Attard*, 6:14-35. *Grimm* teaches determining threats or hazardous conditions by evaluating multiple weighted parameters. *Grimm*, 5:56-6:26. *Prokhorov* teaches a "control weighting module 122 [that] can determine and/or assign weights in any suitable manner." Prokhorov, [0034]. *Konrardy* teaches "weighted risk levels" and that "communication data may include information from other autonomous vehicles." *Konrardy*, 50:18-20. *See also* Ex. B-1 *Attard,* Ex. B-13 *Grimm,* Ex. B-6 *Konrardy,* Ex. B-9 *Prokhorov*, Ex. B-17 *Schunder,* B-19

Gunderson, and B-35 *CMU System* at Claims 3(b)(1)-3(b)(2)/3(c)-3(d), 5(b)/(b)(1), 8(d), 10(a)(3)/10(c). Such combinations involve nothing more than the use of a known technique (e.g., sensors in general and GPS in particular) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., weighing different input and use of broad machine learning technology) according to known methods to yield predictable results. A POSA would have specifically found it obvious to make use of "active learning data" in its various claimed forms in connection with *Autopilot HW1*, particularly as *Autopilot HW1* already included learning, data collection, telemetry, and backlisting functionality. *See, e.g.,* Ex. B-30, *Autopilot HW1* at Claim 3(b)(1), 5(b). A POSA would have been motivated to modify this existing functionality to improve the safety and performance of the vehicle, and would have had a reasonable expectation of success in doing so because only modest software changes would have been required.

At a minimum, a POSA would have found each of the above arrangements obvious to try. In addition, a POSA would have recognized that various arrangements and techniques potentially offered certain advantages. Accordingly, a POSA would have been motivated to try and implement such configurations.

A POSA would have recognized the benefits of utilizing the foregoing features. At a minimum, the claimed configurations of the '765 patent in view of the prior art would be obvious to try because it amounts to a simple substitution or modification of the prior art with a known feature to achieve predictable results. To a POSA, this would be a simple matter of choosing a design.

Moreover, a POSA would have had a reasonable expectation that the combination or modification of the prior art would achieve its intended purpose. Such modifications would have

been straightforward applications of known hardware and software, and would have required nothing more than the common sense of a skilled artisan to implement these known concepts and structures in other known image processing systems. Because these were known techniques, each modification to the prior art would thus be the substitution or addition of a well-known and widely used feature or component for its standard functionality, and therefore would have been a relatively straightforward task within the skillset of a POSA.

3. Obviousness of the Asserted Claims of the ’004 Patent

To the extent that any asserted claim is not found to be anticipated by the prior art, such claims would have been obvious to a POSA at the time of the alleged invention of the ’004 patent, as set forth below and specifically within Exhibits C-1 through C-35.

It would have been obvious to form the combinations set forth in the ’004 IPR Petitions for all the reasons stated therein, including the accompanying expert declaration.

It would have been obvious to a POSA at the time of the alleged invention of the ’004 patent to (i) modify a prior art reference or system to include any allegedly missing limitations recited in the Asserted Claims and/or (ii) combine prior art references or systems, including with a POSA’s general knowledge. Exhibits C-1 through C-35 identify exemplary prior art references and systems that either alone, or in combination with other prior art and/or a POSA’s general knowledge, render the ’004 patent Asserted Claims obvious under 35 U.S.C. § 103. In certain instances, the suggested obviousness combinations are provided in the alternative to Defendant’s anticipation contentions and do not suggest that any reference included in the combinations is not by itself anticipatory or does noy by itself render the asserted claim obvious (e.g., in view of the teachings contained within the prior art reference and/or combined with the general knowledge of a POSA).

To the extent Plaintiff challenges any of these references or combinations as failing to disclose or render obvious one or more elements of the Asserted Claims of the ’004 patent, Defendant reserves the right to supplement these Invalidity Contentions to address that challenge.

A POSA would have been motivated to combine or modify the prior art references and systems identified in Exhibits C-1 through C-35, in view of the teachings of the prior art and/or the common sense and general knowledge of a POSA at the time of invention.

A POSA would have been motivated to combine each of *Attard, Hampiholi, McNew, Yamada*, *Mercedes, Prokhorov, Fields, Autopilot HW1, Fung*, *Waymo*, and *Debouk* with each other or with any combination of *Konrardy*, *Stenneth, Frazer, An, Scofield, Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Engelman, Strauss, Subaru Eyesight, Mobileye,* and *CMU System* to make use of a system of “sensors” including a “steering wheel sensor,” “speedometer,” “GPS sensor,” “thermometer,” and one or more cameras, as recited in, e.g., claims 1, 10, 15, 29, 32, and 37. Vehicles have long had sensors of all types (e.g., tire pressure, oil, brakes) and, indeed, speedometers and thermometers are ubiquitous, helping to monitor or regulate speed and temperature, respectively. Autonomous or semi-autonomous functionality naturally requires additional sensor systems to provide feedback ensuring the correct and safe operation of vehicle systems. In particular, the inclusion of GPS provides enhanced accuracy, and the sensing of internal or external conditions (e.g., via a camera) provides current feedback for vehicle systems that impact safety. For example, *Debouk* teaches subsystems that “monitor conditions of the vehicle including, but not limited to…operator torque requests, steering wheel input, and fuel consumption that may affect the controllability of the vehicle, and/or limit the use of operating the vehicle in LAAD.” *Debouk*, 17:50-55. *Prokhorov* teaches that “the sensor system 125 can include one or

more sensors configured to detect, determine, assess, measure, quantify and/or sense the location of the vehicle 100" and that the system "can include a global positioning system." *Prokhorov*, [0049], [0075]. It also teaches that "[t]he driving environment can include any information about the external environment, including…weather conditions. Such information about the driving environment can be obtained from the sensor system 125 and/or from any other suitable source (e.g. websites, databases, etc.)." *Prokhorov*, [0022]. *Fields* teaches "[t]he on-board computer 114 may interface with the one or more sensors 120 within the vehicle 108 (e.g., an ignition sensor, an odometer, a system clock, a speedometer, a tachometer, an accelerometer, a gyroscope, a compass, a geolocation unit, a camera, a distance sensor, etc.)." *Fields*, 9:25-30. Fung teaches "the vehicle 1900 comprises a driver information sensing device 1906, a vehicle information sensing device 1908, a driver alert device 1910, a GPS 1912, and optionally an external information sensing device 1914." *Fung*, 16:57-17:5. *Waymo* teaches "[w]hat that on-board computer does first is integrate the sensor data. It takes the data from the laser and the cameras and integrates them into a view of the world, which it then uses to orient itself (with rough guidance of GPS) in virtual Mountain View." Ex. C-31 *Waymo* at Claim 1(a). *Yamada* teaches sensing and displaying readings from sensors including specifically GPS, a speedometer, and a thermometer. *Yamada,* 4:26-32, 8:30-9:22. *See also* Ex. C-27 *Yamada*, Ex. C-9 *Prokhorov,* Ex. C-3 *Fields,* Ex. C-4 *Fung*, Ex. C-2 *Debouk*, Ex. C-1 *Attard*, Ex. C-30 *Autopilot HW1*, Ex. C-5 *Hampiholi,* Ex. C-8 *McNew,* and C-34 *Mercedes* at Claim 10(a)/10(a)(4)-10(b)(3). Such combinations involve nothing more than the use of a known technique (e.g., sensors in general and GPS and cameras in particular) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., sensors, including cameras, and GPS) according to known methods to yield predictable results. A POSA would particularly have been motivated to include

more than one camera, and would have found it obvious to do so, because of the well-known improvements to vision and processing that were possible, therefore improving safety and performance. Multi-sensor systems (e.g., camera and radar) as well as multi-camera systems were well known in the art and a POSA would have had a reasonable expectation of success in implementing it.

A POSA would have been motivated to combine each of *Attard, Hampiholi, Fields, Schunder, Grimm, Scofield*, *Sako, Autopilot HW1*, and *Konrardy* with each other or with any combination of *Debouk, Fung, Frazer, An, McNew, Dolgov, Zhu, Kang, Prokhorov, DeRuyck, Gunderson, Tsimhoni, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru Eyesight, Mobileye, Waymo, Stenneth,* and *CMU System* to determine whether a "fault" has or has not occurred based on available information, such as various "thresholds" or "quotas" of driver "competence" over time, as well as "roadway type" or "weather conditions, as recited in, e.g., claims 1, 4, 5, 6, 7, 10, 11, 13, 18, 19, 22, 27, and 37. The detection of faults is critical for any complex system, such as a vehicle, to maintain system integrity and operational readiness and identify problems. A POSA would further have been motivated to look for faults that exceed certain thresholds as a way of calibrating the complex system and avoiding distracting a driver or disabling a system unnecessarily. Similarly, a POSA would have been motivated to monitor the length and duration of faults, so as to ascertain whether a problem has resolved, is worsening, etc. A POSA also would have been motivated to make use of driver "competence levels" in ascertaining faults to ensure safety because, in semi-autonomous systems, best practices at the time require the driver to maintain oversight and ultimate control. For example, *Debouk* teaches that "internal faults (or the possibility thereof) must be assessed by the monitoring of diagnostic conditions to determine the feasibility of performing such maneuvers when fault

handling and degradation is employed. *Debouk*, 22:37-40. It also teaches that in the context of "determining one of a threatening failure, an urgent failure, a critical failure or expired limited-ability autonomous driving capabilities based on the monitored diagnostic conditions." *Debouk*, 25:47-50. *Fung* teaches "monitoring information can include drowsiness information indicating whether a driver is in a normal state or a drowsy state . . . the drowsiness information could include a value indicating the level of drowsiness, for example on a scale of 1 to 10, with 1 being the least drowsy and 10 being the drowsiest." *Fung*, 155:9-22. *Konrardy* teaches that "risk level may be compared against a plurality of predetermined warning thresholds, and the warning presented to the vehicle operator may be determined based upon the highest warning threshold exceeded by the risk level." *Konrardy*, 53:54-59. It also teaches "weighted risk levels" and that "communication data may include information from other autonomous vehicles." *Konrardy*, 50:18-20. *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Hampiholi* teaches "weather condition information as determined from a weather sensor may be used to determine the driving conditions." *Hampiholi*, [0063]. *Grimm* teaches determining hazardous driving conditions caused by weather (e.g. wet/icy roads) using "data provided by participative sensing system vehicles." *Grimm*, 7:54-8:6. *Sako* teaches determining the roadway type, such as a highway or a "general road" using GPS. *Sako*, 34:63-35:21. *See also* Ex. C-5 *Hampiholi,* Ex. C-3 *Fields,* Ex. C-13 *Grimm,* Ex. C-21 *Sako,* Ex. C-6 *Konrardy*, Ex. C-1 *Attard,* Ex. C-17 *Schunder,* Ex. C-30 *Autopilot HW1*, and Ex. C-12 *Scofield* at Claim 6(a), 7(a)-7(b), 27(a)/(b). Such combinations involve nothing more than the use of a known technique (e.g., detecting faults in complex environments with competing signals) to

improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., determining and monitoring faults) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, Fields, Hampiholi, McNew, Frazer*, *An, Scofield, Subaru Eyesight, Autopilot HW1, Mercedes*, *Waymo*, *Debouk*, *Fung*, *Konrardy*, and *Stenneth* with each other or with any combination of *Grimm, Dolgov, Zhu, Kang, Schunder, Prokhorov, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mobileye,* and *CMU System* to determine and implement a "corrective action," including by alerting the driver and/or transferring control to the driver, as recited in claims 1, 6, 10, 12, 13, 14, 15, 18, 22, 23, 27, 29, 33, 35, and 37. As noted above, the detection of faults is critical for any complex system, such as a vehicle, to maintain system integrity and operational readiness and identify problems. A POSA would therefore have been motivated to take "corrective action" to address those faults, including by providing useful alerts to a driver in a semi-autonomous situation, such as the need to take over driving, in the interests of safety. A POSA would have known to take into account available information in determining a corrective action, such as competence levels of the system or driver, in order to make the best possible correction in the interests of safety. Further, a POSA would have been motivated to store related information in a "fault remediation table," as a convenient and well-known way to maintain data that relates corrective actions with fault conditions; this is one of numerous possible design choices that would have been straight forward to implement. For example, *Debouk* teaches that "[t]he operator is warned and requested to take control of the vehicle." *Debouk*, 7:67-8:1. *Fung* teaches "the response system [] can receive vehicle information directly from vehicle systems [] and analyze the vehicle information based on the thresholds of the

failure detection system [].” *Fung*, 155:23-40. Fung teaches “the impact of response system 188 on each vehicle system is described as either ‘control’ type or ‘warning’ type. The control type indicates that the operation of a vehicle system is modified by the control system. The warning type indicates that the vehicle system is used to warn or otherwise alert a driver.” *Fung,* 85:41-59. *Konrardy* teaches that “[w]here control of the vehicle 108 must be returned to the vehicle operator, the controller 204 may alert the vehicle operator in advance of returning to manual operation.” *Konrardy*, 23:40-43. *Stenneth* teaches “the driving mode command transitions the autonomous vehicle to the manual mode, if applicable, when the vehicle confidence score does not exceed the confidence threshold.” *Stenneth*, Abstract. *McNew* teaches disengaging the vehicle’s semi-autonomous system and transferring the driver controls to manual control if the situation is safe enough. *McNew,* 20:7-31, 4:3-5, 8:41-44, Fig. 7. *Fields* teaches that “the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation.” *Fields*, 29:63-30-5. It also teaches that “[i]f the one or more risk levels meet or exceed the critical threshold, the on-board computer 114 may present an alert at block 720 and transfer control to the vehicle operator.” *Fields*, 32:6-10. *Frazer* teaches an action engine 110c including event table 112 for responding to faults in autonomous vehicles. *Frazer*, 21:20-32. *Hampiholi* teaches comparing a fault to several thresholds for determining appropriate responses. *Hampiholi,* [0056]-[0057], Fig. 4. *Waymo* teaches “[w]hen faced with a partially blocked-off road, the car switched between autonomous and manual modes and then braked to a halt, requiring Urmson, the safety driver, to take control.” Ex. C-31 *Waymo* at Claim 1(j). *See also* Ex. C-3 *Fields,* Ex. C-5 *Hampiholi,* Ex. C-8 *McNew,* Ex. C-11 *Frazer*, Ex. C-2 *Debouk*, Ex. C-4 *Fung*, Ex. C-6 *Konrardy*, Ex. C-10

Stenneth, Ex. C-1 *Attard,* Ex. C-12 *Scofield,* Ex. C-7 *An,* Ex. C-33 *Subaru Eyesight,* Ex. C-30 *Autopilot HW1*, and Ex. C-34 *Mercedes* at Claim 1(d)-1(j), 6(c)-6(d), 12(b)/(c), 29(h)/(k). Such combinations involve nothing more than the use of a known technique (e.g., correcting fault conditions in complex environments with competing signals) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., identifying corrective actions for faults) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Attard, An, Scofield, Fields*, *Debouk*, *Fung*, *Stenneth, Prokhorov*, *Autopilot HW1*, and *CMU System* with each other or with any combination of *Hampiholi, Frazer, McNew, Grimm, Dolgov, Zhu, Kang, Schunder, DeRuyck, Gunderson, Tsimhoni, Sako, Coelingh, Nagasaka, Hada, Pampus, Duncan, Yamada, Engelman, Strauss, Mercedes, Subaru Eyesight, Mobileye, Waymo*, and *Konrardy* to determine a "competence level" for a vehicle and/or its control processor, including by comparing to various "thresholds" and using a "weighted voting system," and which accounts for "current weather condition" of the roadway, as recited in claims 1, 6, 7, 8, 15, 16, 29, 37, 38, and 39. Determining states and competencies of vehicle systems, including processors, are critical for any complex system to maintain system integrity and operational readiness and identify and address problems. A POSA would have been motivated to compare to various "thresholds" because, in a complex system with competing signals that are not simply binary, the system's "competence" is most accurately determined by assessing the levels of various signals, thereby improving safety and performance. Similarly, a POSA would have been motivated to make use of a "weighted voting system" and multiply "weights" as a way of interpreting and calibrating competing signals/information in a complex system and ultimately avoiding unnecessarily distracting a driver

or disabling a system unnecessarily. For example, *Debouk* teaches "determining a critical failure having an immediate adverse effect on the ability of the system to continue operation in limited-ability autonomous driving". *Debouk*, 26:32-34. Fung teaches "vehicle information can include vehicle and/or vehicle system conditions, states, statuses, behaviors, and information about the external environment of the vehicle (e.g., other vehicles, pedestrians, objects, road conditions, weather conditions)." *Fung,* 17:6-19. *Stenneth* teaches "[a] computing device calculat[ing] a vehicle confidence level based on at least one confidence factor" and that "[w]hen the vehicle confidence exceeds the confidence threshold, the computing device 122 determines that the conditions are suitable for autonomous driving." *Stenneth*, 1:44-45, 3:5-7. *Autopilot HW1* makes use of Kalman filters, which applies weights to prioritize more reliable data and minimize error; using additional weights in other contexts would have been obvious and routine. Ex. C-30 *Autopilot HW1* at Claim 2(d). *Fields* teaches that "the on-board computer 114 may determine whether the one or more autonomous operation risk levels exceed a critical risk threshold…For example, the total failure of a LIDAR system of the vehicle 108 may require immediate reversion to manual operation or cessation of vehicle operation." *Fields*, 29:63-30-5. *Prokhorov* teaches that "[t]he driving environment can include any information about the external environment, including…weather conditions. Such information about the driving environment can be obtained from the sensor system 125 and/or from any other suitable source (e.g. websites, databases, etc.)." *Prokhorov*, [0022]. *An* teaches calculating an "autonomous driving risk index" using weights. *An*, 5:54-6:24. *Scofield* teaches determining if a driving condition exceeds a complexity threshold for autonomous driving. *Scofield*, 1:55-2:2. *See also* Ex. C-7 *An,* Ex. C-12 *Scofield,* Ex. C-3 *Fields*, Ex. C-2 *Debouk*, Ex. C-4 *Fung*, Ex. C-10 *Stenneth,* Ex. C-9 *Prokhorov*, Ex. C-1 *Attard,* and Ex. C-35 *CMU System* at Claim 1(c), 2(d)-2(h)/2(c)-2(f), 6(b)-6(c), 7(c)/(d), 9(d), 29(d)/(g), 31(a), 31(b), 37(b)-

37(g)/37(f)-37(k), 38(a)-38(b). Such combinations involve nothing more than the use of a known technique (e.g., detecting system state using known techniques) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., assessments of processor and system state) according to known methods to yield predictable results.

A POSA would have been motivated to combine each of *Hampiholi, An, McNew, DeRuyck, Duncan, Mercedes, Autopilot HW1, Debouk*, *Fung*, *Fields*, *Konrardy*, and *Stenneth* with each other or with any combination of *Attard, Frazer, Scofield, Grimm, Dolgov, Zhu, Kang, Schunder, Gunderson, Tsimhoni, Sako, Prokhorov, Coelingh, Nagasaka, Hada, Pampus, Yamada, Engelman, Strauss, Subaru Eyesight, Mobileye, Waymo,* and *CMU System* to determine a "competence level of a human driver" over time, including as it exceeds/is below various "thresholds" or "quotas," and using a "weighted voting system" and "active learning data" from other vehicles on roads with similar conditions, as recited in, e.g., claims 1, 2, 3, 5, 9, 10, 15, 16, 17, 18, 20, 22, 24, 29, 31, 35, and 36. In an autonomous or semi-autonomous vehicle, a POSA would have been motivated to monitor and assess the capabilities and competence of the driver in order to ensure safety of vehicle operations that depend on him or her, and memorialize determinations in a "driver profile." Indeed, industry standards at the time required this. *See* SAE J3016 at 2 (noting "the expectation that the *human driver* will respond appropriately to a *request to intervene*"); *id.* (noting "*Human Driver* monitors the driving environment" with the "expectation that the *human driver* perform all remaining aspects"); *Debouk*, 1:57-59 (explaining that "[k]nown methods detect the attentiveness of the operator and alert the driver that a response is required if an internal fault is detected."). A POSA would further have been motivated to make use of cameras or sensors in order to make such determinations because of the need to ensure the driver

is engaged. A POSA would also have been motivated to make use of a "weighted voting system" and multiply "weights" as a way of interpreting and calibrating competing signals/information in a complex system and ultimately avoiding unnecessarily distracting a driver or disabling a system unnecessarily. A POSA would further have been motivated to make use of learning data from a wide variety of vehicle fleets and in a variety of conditions to provide the best possible information for the vehicle to rely. For example, *Debouk* teaches "determining one of an inattentive driver if the warning configured to re-gain the attention of the operator is unsuccessful." *Debouk*, 24:47-50. *Konrardy* teaches that "[o]nce the risk levels associated with…manual operation…have been weighted by the expected use levels, the total risk level for the vehicle and operator may be determined." *Konrardy*, 39:24-27. *Fung* teaches "monitoring information can include drowsiness information indicating whether a driver is in a normal state or a drowsy state . . . the drowsiness information could include a value indicating the level of drowsiness, for example on a scale of 1 to 10, with 1 being the least drowsy and 10 being the drowsiest." *Fung*, 155:9-22. *Stenneth* teaches that "[s]ome drivers (e.g., inexperienced drivers, young drivers, or accident prone drivers) may be assigned higher vehicle confidence scores so that the autonomous driving mode is more likely to be selected." *Stenneth*, 10:10-14. *Fields* teaches determining "whether it is safer for a human to drive the vehicle or for the vehicle to automatically drive itself based upon…the driver profile and/or driver behavior data associated with the specific driver." *Fields*, 33:28-34. *Hampiholi* teaches collecting sensor readings to determine a human driver's competence level as impacted by the severity rank of distraction being experienced. *Hampiholi*, [0062], Fig. 5. *An* teaches tracking a driver's blinking or line-of-sight to determine dozing or inattentiveness. *An*, 2:46-65. *See also* Ex. C-5 *Hampiholi,* Ex. C-7 *An,* Ex. C-2 *Debouk*, Ex. C-4 *Fung*, Ex. C-3 *Fields*, Ex. C-6 *Konrardy*, Ex. C-10 *Stenneth*, Ex. C-8 *McNew,* Ex. C-18 *DeRuyck*, Ex. C-26 *Duncan,* Ex. C-30 *Autopilot*

HW1, and Ex. C-34 *Mercedes* at Claim 1(d)-1(h), 2(a)-2(d). Such combinations involve nothing more than the use of a known technique (e.g., assessing driver ability) to improve automobiles/passenger vehicles in the same way. Such combinations are nothing more than combinations of prior art elements (e.g., assessments of driver competence) according to known methods to yield predictable results. A POSA would have specifically found it obvious to make use of "active learning data" in its various claimed forms in connection with *Autopilot HW1*, particularly as *Autopilot HW1* already included learning, data collection, telemetry, and backlisting functionality. *See, e.g.,* Ex. C-30, *Autopilot HW1* at Claim 2(c). A POSA would have been motivated to modify this existing functionality to improve the safety and performance of the vehicle, and would have had a reasonable expectation of success in doing so because only modest software changes would have been required.

The Asserted Claims of the '004 patent recite various "thresholds" that are used for various comparisons and determinations. For example, claim 1 recites: "comparing the competence level of the human driver to a first threshold" and a "second threshold"; "determining that no fault has occurred when the competence level . . . exceeds the first threshold and . . . the second threshold"; "determining that a first fault has occurred when the competence level of the human driver exceeds the second threshold and is below the first threshold" and that a "second fault has occurred when the competence level of the human driver is below the first threshold and is below the second threshold." Claim 6 adds on "determining that a third fault has occurred when . . . the competence level of the SDV is above a third threshold" and claim 7 similarly uses a "third threshold." *See also* Claims 18, 22 (time exceeds "thresholds"); claims 37, 38 ("comparing the competence level of the control processor to" first, second, and third "thresholds"). The claims require mere "thresholds" but do not require any particular thresholds. Indeed, the specification of the '004

patent does not provide any guidance on how thresholds are determined or set. Given the various analyses, signals, and inputs to a semi-autonomous vehicle, a POSA would have been motivated to implement "thresholds" as a way of ascertaining the relevance and importance of the information and it would have been obvious to do so. As one example, sensor input to an autonomous vehicle does not provide a binary "yes" or "no," but rather provides information about things like vehicle location, position in the lane, conditions of upcoming roadway, and driver capabilities. Putting both upper and lower thresholds on this data gives it meaning and allows the system to properly use it. A POSA would have had a reasonable expectation of success in using thresholds, as the use of "thresholds" to ascertain the importance or relevance of information is well known, including in the vehicle context. *See, e.g.*, *Debouk*, 24:14-18 ("a plurality of specific conditions necessary for preferred and reliable use of limited-ability autonomous driving are all satisfied, one of the specific conditions satisfied when monitored driver attentiveness criteria indicates the driver is attentive"); *Fung,* 155:23-40 ("In another embodiment, the response system 188 can receive vehicle information directly from vehicle systems 126 and analyze the vehicle information based on the thresholds of the failure detection system 244. For example, the response system 188 can receive a control signal 11902 from a steering system and analyze the control signal 11902 with respect to the failure thresholds"); *Stenneth*, Abstract ("A computing device calculates a vehicle confidence level based on at least one confidence factor and compares the confidence threshold to the vehicle confidence level."); *Stenneth*, 7:26-31 ("A third range, for example from the second threshold value to a third tier threshold (e.g., 50 absolute points higher, 50% higher than the threshold value, or an open ended maximum value), the autonomous driving computer may include high risk driving functions."); *Konrardy*, 53:54-58 ("the risk level may be compared against a plurality of predetermined warning thresholds, and the warning presented to the vehicle

operator may be determined based upon the highest warning threshold exceeded by the risk level."); *Konrardy*, 4:23-33 ("Determining the one or more risk levels associated with the one or more autonomous operation features may include predicting the one or more risk levels based upon a comparison of (i) the one or more test output signals generated by the one or more software routines, (ii) one or more other test output signals generated by one or more other software routines of one or more other autonomous operation features in response to one or more other test input signals, and/or (iii) observed operating data regarding the one or more other autonomous operation features disposed within a plurality of other vehicles operating outside the virtual test environment."); *Hampiholi,* [0056]-[0057], Fig. 4; *Attard,* 8:1-45. Implementing a variety of upper and/or lower thresholds for any inputs would have been a simple mathematical operation done in software.

The Asserted Claims of the '004 patent recite the use of a "weighted voting system" and applying/multiplying various groupings of "weights" to inputs or other values, including based on various sets of "active learning data." For example, claim 2 recites "using a weighted voting system with a first plurality of inputs and first plurality of weights" whereby an "input is multiplied by a weight from among a first plurality of weights" and the "weights are based on first active learning data." These weights are used in claim 2 for "determining the competence level of the SDV." *See also* claims 8, 9, 10, 15, 17, 18, 20, 21, 23, and 31 (similarly using weights for various operations and determinations). According to the specification of the '004 patent, "[i]n one or more embodiments of the present invention a weighted voting system is used to weight the various variables used in making the decision that is triggered by faults." '004 patent, 8:58-9:4 (further describing inputs, weights, and quota). The use of weights in the manner of the '004 patent was well known in the art. *See, e.g.*, *Konrardy*, 39:24-27 ("Once the risk levels associated

with…manual operation…have been weighted by the expected use levels, the total risk level for the vehicle and operator may be determined."); *Prokhorov*, [0034] ("The control weighting module 122 [that] can determine and/or assign weights in any suitable manner."); *Fields*, 7:35-37 ("In one aspect, the benefit of one or more autonomous or semi-autonomous functionalities or capabilities may be determined, weighted, and/or otherwise characterized."). *Attard* ("By assessing such collected data 115, and possibly weighting various determinations, e.g., a determination of a sensor data collector 110 accuracy and one or more determinations relating to external and/or environmental conditions, e.g., presence or absence of precipitation, road conditions, etc., one or more confidence assessments 118 may be generated providing one or more indicia of the ability of the vehicle 101 to operate autonomously."); *DeRuyck,* ("Each of the weights 1020 is configured to weight the output of one of the disparate data sources."); *An,* 5:53-6:24 (". . . the autonomous driving state risk index is calculated by multiplying weights W1, W2, W3, and W4 by a recognition error, a determination error, a control error, and a map data error, respectively, and by obtaining the sum of multiplication results. In this case, the weights W1, W2, W3, and W4 are values determined according to the importance level used in an autonomous driving algorithm."); *Kang,* 10:62-11:6 (". . . the control unit 230 identifies a weight for each speed range of the vehicle, a weight for each driving direction, a weight for each steering angle range, a weight for each type of the road, a weight for each weather condition, a weight for each sightline of the driver, a weight to be applied when a driver is or is not speaking, a weight for each degree of concentration of the driver, a weight to be applied when a passenger has or has not boarded, and a weight to be applied when a passenger is or is not manipulating the terminal, sums the identified weights, and identifies a function restriction level corresponding to the summed weight."); Ex. C-30 *Autopilot HW1* at Claim 2(d) (making use of Kalman filters, which apply weights to prioritize more reliable data and

minimize error; using additional weights in other contexts would have been obvious and routine); *Grimm,* 5:41-6:4; *Gunderson,* [0062]. Similarly, the specification of the '004 patent describes, "In one or more embodiments of the present invention, active learning is employed so that the system as a whole learns from the experiences of many SDVs and drivers, in different geographies and among cohorts." '004 patent, 9:5-10. The use of such "active learning" was similarly well known in the art. *See, e.g.*, *Schunder*, 5:49-61("the vehicle can predictively adjust control settings in accordance with weather to be encountered."); *Grimm*, 5:56-6:26 (". . . the individual module may determine through computer aided analysis of event data for an individual or through input from an operator who has reviewed event data for the individual that the individual driver has a tendency to change lanes without employing a turn signal first."); *Gunderson*, [0060]-[0062]; *Konrardy*, 50:18-20 (teaching "weighted risk levels" and that "communication data may include information from other autonomous vehicles."). In the context of a semi-autonomous vehicle, where various complex inputs need to be managed and synthesized into usable information, it would have been obvious to use, and a POSA would have been motivated to make use of, such a "weighted voting system" as a way of making sense of various non-binary input signals; it is a design choice, applying one of numerous possible algorithms. Multiplying weights was simply the known way of implementing this. A POSA would further have been motivated to make use of "active learning" information from a variety of cohorts of vehicles in a variety of circumstances, in order to refine the weights to handle signals based on experience, resulting in better performance and safety for the vehicle. A POSA would have had a reasonable expectation of success, as the techniques were well known and could be implemented in software using straightforward mathematical operations.

At a minimum, a POSA would have found each of the above arrangements obvious to try. In addition, a POSA would have recognized that various arrangements and techniques potentially offered certain advantages. Accordingly, a POSA would have been motivated to try and implement such configurations.

A POSA would have recognized the benefits of utilizing the foregoing features. At a minimum, the claimed configurations of the ’004 patent in view of the prior art would be obvious to try because it amounts to a simple substitution or modification of the prior art with a known feature to achieve predictable results. To a POSA, this would be a simple matter of choosing a design.

Moreover, a POSA would have had a reasonable expectation that the combination or modification of the prior art would achieve its intended purpose. Such modifications would have been straightforward applications of known hardware and software, and would have required nothing more than the common sense of a skilled artisan to implement these known concepts and structures in other known image processing systems. Because these were known techniques, each modification to the prior art would thus be the substitution or addition of a well-known and widely used feature or component for its standard functionality, and therefore would have been a relatively straightforward task within the skillset of a POSA.

III. INVALIDITY OF THE ASSERTED CLAIMS FOR FAILURE TO COMPLY WITH THE REQUIREMENTS OF 35 U.S.C. § 112

A. 35 U.S.C. § 112(a) (Enablement and Written Description)

Based on Defendant’s present understanding of Plaintiff’s asserted scope of the Asserted Claims, to the extent such positions can be understood from Plaintiff’s Infringement Contentions, Defendant asserts that the Asserted Claims are invalid for failure to provide a written description

that enables the full scope of the Asserted Claims based on at least the following claim terms, phrases, or limitations:

- "active learning data" ('402 patent, claims 2, 8-10; '765 patent, claims 3, 5, 8, 10, 13, 14, 18, 20; '004 patent, claims 6, 8-10, 13, 17, 20, 24, 31)
- "querying a database" ('402 patent, claim 13; '765 patent, claims 6, 8)
- "the first active learning data comprising information about a cohort of other SDVs experiencing a camera sensor operational anomaly" ('402 patent, claim 8)
- "[the computer system is capable of] determining a competence level of the processor [a control processor]" ('402 patent, claims 4, 9; '765 patent, claim 6; '004 patent, claim 37)
- "the computer system determines the competence level of the processor using active learning data, said active learning data including information from other SDVs" ('402 patent, claim 6)
- determining a human driver competence level based on sensor data ('402 patent, claims 6, 8, 9; '765 patent, claims 5, 10, 14, 20; '004 patent, claims 1, 2, 9, 10, 15, 24, 29, 31, 36)
- weighted voting ('402 patent, claims 8, 9, 10; '765 patent, claims 3, 5, 8, 11, 13, 14, 18, 20; '004 patent, claims 2, 8, 9, 10, 17, 18, 20, 21, 31)
- "the active learning data includes weather condition data from a cohort of other SDVs, wherein the weather condition data shares one or more traits with the current weather condition of the roadway on which the SDV is currently traveling" ('765 patent, claims 3, 13, 14, 18)
- multiple thresholds surpassed sequentially ('765 patent, claims 11, 12, 14, 15, 16; '004 patent, claims 1, 37, 38)
- "determining a competence level of the SDV" ('004 patent, claims 1, 29)
- "determining the competence level of the SDV comprises determining whether the SDV is currently operating in a first autonomous mode of a plurality of autonomous modes" ('004 patent, claim 6)
- "the first plurality of weights comprising first active learning data from a first cohort of other SDVs" ('004 patent, claim 10)
- "a fault remediation table comprising a first quota, a second quota" ('004 patent, claim 10)
- "determining [determines the] competence level of a human driver" ('402 patent, claims 4, 6, 8; '765 patent, claims 5, 6, 7, 20; '004 patent, claims 1, 29)

- "determining a competence level of a human driver using the first weighted voting result" ('004 patent, claim 10)
- The "human driver competence level" determined at the SDV ('004 patent, claims 15, 16)
- "autonomously [controlling the vehicle] without requiring the human driver to control the turn signal" ('004 patent, claims 16, 23, 33)
- "determining a length of time during which the sensor configured to detect input from a steering wheel has not detected input from the human driver" ('004 patent, claims 18, 22)
- "displaying a position of another vehicle relative to the SDV" ('004 patent, claims 21, 30)
- "wherein the competence level of the SDV is a function of a degree of uncertainty in the determined position of another vehicle" ('004 patent, claim 29)
- "displaying, on the display screen, a graphical representation of the competence level of the SDV" ('004 patent, claim 30)
- "displaying, on the display screen, a simultaneous graphical representation of the position of the other vehicle, the position of the lane marking on the roadway, the position of the traffic signal, and the competence level of the SDV" ('004 patent, claim 32)
- "the competence level of the human driver is a function of a sensor reading from the camera directed at the human driver" ('004 patent, claim 34)
- Entirety of claim 36 of the '004 patent

Defendant asserts any claim phrase matching the prior list lacks enablement and/or written description, even if not explicitly listed above. Based on Defendant's present understanding of Plaintiff's Infringement Contentions and apparent interpretation of the scope of the Asserted Claims, at least one or more of these claim terms, phrases, and limitations are not described in the specification of the identified patent and do not enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

B. 35 U.S.C. § 112(b) and (f) (Indefiniteness)

Based on Defendant's present understanding of Plaintiff's asserted scope of the Asserted Claims, to the extent such positions can be understood from Plaintiff's Infringement Contentions,

Defendant asserts that the Asserted Claims are invalid as indefinite for reciting at least the following claim terms, phrases, or limitations:

- "operational state" ('402 patent, claim 4; '765 patent, claims 1, 6, 17; '004 patent, claims 8, 37, 39)
- "threshold for danger" ('402 patent, claims 9, 11; '765 patent, claims 1, 4, 17)
- "active learning data" ('402 patent, claims 2, 8-10; '765 patent, claims 3, 5, 8, 10, 13, 14, 18, 20; '004 patent, claims 6, 8-11, 13, 17, 20, 24, 31)
- "[the computer system is capable of] determining a competence level of the processor [a control processor]" ('402 patent, claims 4, 9; '765 patent, claim 6; '004 patent, claim 37)
- "the computer system determines the competence level of the processor using active learning data, said active learning data including information from other SDVs" ('402 patent, claim 6)
- "immediately" ('765 patent, claim 17)
- "quota" ('004 patent, claims 11, 13, 29, 35,
- "the first plurality of weights comprising first active learning data from a first cohort of other SDVs" ('004 patent, claim 10)
- "a fault remediation table" ('765 patent, claim 16; '004 patent, claims 1, 6, 10, 15, 29, 33, 37)
- "a fault remediation table comprising a first quota, a second quota" ('004 patent, claim 10)
- "determining [determines the] competence level of a human driver" ('402 patent, claims 4, 6, 8; '765 patent, claims 5, 6, 7, 20; '004 patent, claims 1, 29)
- "determining a competence level of a human driver using the first weighted voting result" ('004 patent, claim 10)
- "determining a competence level of the SDV" ('004 patent, claims 1, 29)
- "wherein the competence level of the SDV is a function of a degree of uncertainty in the determined position of another vehicle" ('004 patent, claim 29)

These claim terms, phrases, and limitations, as apparently construed by Plaintiff, violate the definiteness requirements of 35 U.S.C. § 112. Defendant asserts any claim phrase matching the prior list is indefinite, even if not explicitly listed above.

Based on Defendant's present understanding of Plaintiff's Infringement Contentions, at least one or more of these claim terms, phrases, and limitations are indefinite because they are inconsistent with and broader than the alleged invention disclosed in the specification and during prosecution, and given Plaintiff's apparent constructions of the claims, any person of ordinary skill in the art at the time of the invention would not understand what is claimed with reasonable certainty, even when the claims are read in light of the specification and prosecution history.

IV. INVALIDITY OF THE ASSERTED CLAIMS UNDER 35 U.S.C. § 101

Pursuant to the Order Regarding Eligibility, Tesla provides the following Eligibility Contentions.

As described below, in Exhibits A-1 through D-3 and the IPR Petitions, which are incorporated by reference as if fully set forth here, Defendant contends that all Asserted Claims of the Patents-in-Suit are directed to ineligible subject matter under 35 U.S.C. § 101. Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibits D-1 through D-3 contain charts for each Asserted Patent identifying each exception to eligibility to which each claim is directed and the factual and legal basis therefor. Pursuant to section (a)(2)(A) of the Order Regarding Eligibility the charts in Exhibits D-1 through D-3, read in conjunction with the discussion herein and in Exhibits A-1 through C-35 and the IPR Petitions, and together with the material described, referenced, or cited in the charts, further provide a description of the industry, at the relevant time, in which the claims are alleged to be well understood, routine, and conventional, and the factual and legal basis therefor. Further, pursuant to sections (a)(2)(B) and (a)(3) of the Order Regarding Eligibility, the charts in Exhibits D-1 through D-3, read in conjunction with the discussion herein,

and together with the material described, referenced, or cited in the charts, further provides: (i) a description of how each element of each claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the claims are otherwise ineligible for patent protection.

Additionally, pursuant to section (b) of the Order Regarding Eligibility, Defendant is concurrently producing or making available for inspection and copying the materials on which Defendant presently seeks to rely for subject-matter eligibility purposes. These prior art references and other materials are cited herein or in Exhibits A-1 through C-35. For the avoidance of doubt, Defendant may rely on the materials identified in Section II, above. Without concession that expert testimony is necessary to resolve the subject matter eligibility of the Asserted Claims, Defendant reserves the right to further rely on expert testimony to be disclosed in accordance with the First Amended Docket Control Order. Defendant's search for prior art references, additional documentation, and/or corroborating evidence concerning prior art systems and devices is ongoing. Accordingly, Defendant reserves the right to supplement their production as Defendant obtains additional prior art references, documentation, and/or corroborating evidence concerning subject matter eligibility during the course of discovery.

Defendant reserves the right to supplement their document production pursuant to section (b) of the Order Regarding Eligibility as authorized by the Patent Local Rules, the Order Regarding Eligibility, or any other order of the Court.

A. Patent Ineligibility

Section 101 "defines the subject matter that may be patented under the Patent Act." *Bilski v. Kappos*, 561 U.S. 593, 601 (2010). Under § 101, the scope of patentable subject matter encompasses "any new and useful process, machine, manufacture, or composition of matter, or

any new and useful improvement thereof." *Id.* (quoting 35 U.S.C. § 101). These categories are not limitless, § 101 contains an important exception—abstract ideas are not patentable. *Alice Corp. Pty. Ltd. V. CLS Bank Int'l*, 573 U.S. 208, 134 S. Ct. 2347, 2354 (2014). The determination of whether a claim recites patent-eligible subject matter under § 101 is guided by the two-step analytical framework set forth in *Alice*. *Id.* at 2355. The first step requires determining whether the claims are directed to an abstract idea. *Id.* If so, the second step requires determining whether the claim elements, considered individually and as an ordered combination, "amount to significantly more" than the patent-ineligible concept. *Id.*

Alice Step One examines the fundamental concept, or the "focus" of the claim and determine whether the claim as a whole is directed to an abstract idea. *See Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015) ("Under step one of *Mayo/Alice*, the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter."). While courts should be careful not to oversimplify the claims at this stage of the analysis, the analysis should not focus on excess verbiage or implementation details, but instead focus on the "concept embodied by the majority of the limitations." *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014); *see also Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1256 (Fed. Cir. 2016) (examining claim after being "stripped of excess verbiage"). Transformation into a patent-eligible claim requires "more than simply stating the abstract idea while adding the words 'apply it.'" *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012)). Also, a claim is not meaningfully limited if it includes only token or insignificant pre- or post-solution activity— such as merely identifying a technological environment. *Mayo*, 132 S. Ct. at 1297–98, 1300–01. Finally, "simply appending conventional steps, specified at a high level of generality," to abstract ideas cannot make those

ideas patentable. *Mayo*, 132 S. Ct. at 1300; *see also Fort Props., Inc. v. Am. Master Lease LLC*, 671 F.3d 1317, 1323 (Fed. Cir. 2012) ("Such a broad and general limitation does not impose meaningful limits on the claim's scope.").

The Federal Circuit has clarified that a relevant inquiry at *Alice* Step One is to "ask whether the claims are directed to a specific improvement in the capabilities of computing devices, or, instead, 'a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool.'" *Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1361-62 (Fed. Cir. 2018) (quoting *Enfish, LLC*, 822 F.3d at 1336). In *Core Wireless Licensing*, the Federal Circuit noted that in *Enfish*, "unlike claims that merely 'add[ ] conventional computer components to well-known business practices,' the claimed self-referential table was 'a specific type of data structure designed to improve the way a computer stores and retrieves data in memory.'" *Id.* (quoting *Enfish*, 822 F.3d at 1338–39). The Federal Circuit further emphasized that claims directed to the improvement in the functioning of a computer must teach a specific and new method that enables a computer "to do things it could not do before." *Id.* For example, in *Finjan, Inc. v. Blue Coat Systems, Inc.*, the Federal Circuit "held claims directed to a behavior-based virus scanning method directed to patent eligible subject matter because they 'employ[ ] a new kind of file that enables a computer security system to do things it could not do before, . . .'" *Id.* (citing *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299 (Fed. Cir. 2018)).

If the claim is directed to an abstract idea, *Alice* Step Two requires the court to evaluate whether there is, apart from the abstract idea, "an 'inventive concept'—*i.e.*, an element or combination of elements that is "sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself." *Alice*, 573 U.S. at 217-218 (internal quotations and citations omitted); *see also Berkheimer v. HP, Inc.*, 881 F.3d 1360, 1367

(Fed. Cir. 2018) (In the *Alice* Step Two analysis, courts examine whether the claim limitations "involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry.'"). The inventive concept "must be evident in the claims." *Two-Way Media Ltd. V. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1338–39 (Fed. Cir. 2017) (affirming patent ineligibility finding because "[t]he main problem that [plaintiff] cannot overcome is that the *claim*—as opposed to something purportedly described in the specification—is missing an inventive concept") (emphasis in original).

A patentee cannot transform an abstract idea to patentable subject matter by limiting the abstract idea to "a particular technological environment," nor by adding "well-understood, routine, conventional" features. *Mayo Collaborative Servs. v. Prometheus Labs., Inc*., 566 U.S. 66, 78–80 (2012). Transformation requires "more than simply stating the abstract idea while adding the words 'apply it.'" *Alice*, 573 U.S. at 221 (*quoting Mayo*, 566 U.S. at 72). Considering "the ubiquity of computers," claiming a "wholly generic computer implementation" of an abstract concept is insufficient to transform the ineligible concept into patent-eligible subject matter. *Id.* at 223-224. Rather, the claim must be directed to a specific "improvement in computer capabilities" rather than "an 'abstract idea' for which computers are invoked merely as a tool." *Enfish, LLC v. Microsoft Corp*., 822 F.3d 1327, 1336 (Fed. Cir. 2016).

Under this framework, all of the Asserted Patents are invalid under 35 U.S.C. § 101 for being directed to ineligible subject matter.

B. Ineligibility of the '402 Patent

Each of the Asserted Claims of the '402 patent (claims 4, 6, 8, 9-11, 13) is directed to subject matter that is not patentable under 35 U.S.C § 101 because they describe generic computer components to perform a process with well-known, functional steps that could be performed by a

human without requiring any specific technological improvement. The ’402 patent claims are therefore unpatentable for failure to recite patent eligible subject matter.

The ’402 patent is titled “Controlling driving modes of self-driving vehicles” and claims computer functionalities for a self-driving vehicle (“SDV”), as well as “[a] computer program product for controlling a driving mode” of an SDV. These receive sensor readings from a plurality of well-known sensors, determine whether a fault has occurred based on the sensor readings, determine whether the fault exceeds a threshold for danger, determine a corrective action associated with the fault, and implement the corrective action. ’402 patent, 1:41-59, 8:13-46. “The computer program product may include a computer readable program medium (or media) having computer readable program instructions thereon for causing a processor to carry out aspects of the present invention.” *Id.* at 2:19-24. The patent describes the “computer readable storage medium” as “a tangible device that can retain and store information for use by an instruction execution device,” and could be, for example, but not limited to, “an electronic storage device, a magnetic storage device, an optical storage device, an electromagnetic storage device, a semiconductor storage device, or any suitable combination of the foregoing.” *Id*. at 2:25-32. The patent goes on to provide “a non-exhaustive list,” with numerous more specific examples, of computer readable storage mediums. *Id.* at 2:32-43. The patent similarly provides a non-specific, expansive description of the possible ways the “computer readable program instructions” can be downloaded and the possible form they may take. *Id.* at 2:50-3:24.

In *Alice* Step One, the Court examines the “focus” of the claims and their “character as a whole” to determine if the patent is directed to an abstract idea. *See Elec. Power Grp*., 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Alice*, 573 U.S. at 216, 219 (courts must evaluate whether the patent claims “[o]n their face” are directed to a patent-eligible subject matter). Representative claim 4

purports to claim a SDV with a sensor system comprising a plurality of sensors; standard vehicle controls comprising engine throttle, steering mechanism, and braking system, and a computer system that is capable of (1) receiving a sensor reading from the system and sensors, (2) operating the vehicle controls, (3) determining the operational state of the SDV, (4) determining a vehicle fault, (5) determining a competence level of a processor, (6) determining a competence level of a human driver, (7) determining a corrective action using the competence level of the processor and the competence level of the human driver, (8) implementing the corrective action, and (9) issuing an alert indicating the corrective action. '402 patent, 21:64-22:24. The "focus" of the '402 patent is directed to a system for gathering and processing data about the vehicle and human driver and using that data to implement a corrective action, if needed.

The Federal Circuit has generally found that claims directed to gathering, processing, and using data are directed to abstract ideas. *See, e.g.*, *Bot M8 LLC v. Sony Corp. of Am.*, 4 F.4th 1342, 1358 (Fed. Cir. 2021) (finding a patent directed to gathering, processing, and using data from gaming machines patent ineligible); *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (finding patents directed to systems and methods for performing real-time performance monitoring, collecting data from multiple data sources, analyzing the data, and displaying the results directed to an abstract idea); *iLife Techs. Inc. v. Nintendo of Am., Inc.*, 839 F. App'x 534, 536 (Fed. Cir. 2021) (finding a patent directed to a motion sensor system that evaluates and communicates data patent ineligible. "[T]he essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101." *Elec. Power Grp., LLC*, 830 F.3d 1350 at 1356. Here, claim 4 of the '402 patent is similarly result-focused and functional in nature and contains elements for gathering, processing, and using information to determine whether corrective action is necessary and, if so, carrying out the corrective action.

Symbology Innovations, LLC v. Dexcom, Inc., 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) ("These steps do little more than describe the desired outcome. They fail to limit the claims to any particular technological solution that would transform the claims into a patent-eligible invention.").

Moreover, the process claimed in the '402 claims is capable of being performed by a human. For example, a human can (1) receive sensor readings from the system and sensors or observe the conditions himself by evaluating the vehicle conditions, looking at the road, mirrors and speedometer, (2) manually operate the vehicle controls, (3) determine the operational state of the vehicle through observation, (4) determine a vehicle fault using the prior observations, (5) determine a competence level of a processor through observation, (6) determine a competence level of a human driver through observation, (7) decide whether a corrective action is needed using the observed competence level of the processor and the competence level of the human driver, (8) implement the corrective action such as by pulling over or adjusting vehicle controls, and (9) provide a report that a corrective action was taken. This further demonstrates that they are directed to an abstract idea. *Voter Verified, Inc. v. Election Sys. & Software LLC*, 887 F.3d 1376, 1385 (Fed. Cir. 2018) (claims drawn to fundamental human activity are "nothing more than abstract ideas"); *FairWarning IP, LLC v. Iatric Sys., Inc*., 839 F.3d 1089, 1095 (Fed. Cir. 2019) (system implementing an old practice in a new environment using same rules considered by humans for decades was directed to an abstract idea); *Symbology Innovations, LLC v. Dexcom, Inc*., 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) (finding claims that "can be performed in the human mind, or by a human using a pen and paper" directed to an abstract idea)*; Voxathon LLC v. Alpine Electronics of America, Inc*., 2016 WL 260350 at *3 (E.D. Tex. Jan. 20, 2019) (same).

Under *Alice* Step Two, the '402 patent does not add an inventive step to the abstract idea. For example, claim 4 of the '402 patent does not claim an improvement on functionality or provide a specific technological solution. *See, e.g.*, *Recentive Analytics, Inc. v. Fox Corp.*, 134 F.4th 1205, 1215-16 (Fed, Cit. 2025) ("patents that do no more than claim the application of generic machine learning to new data environments, without disclosing improvements to the machine learning models to be applied, are patent ineligible under § 101"); *Nexuscard, Inc. v. The Kroger Co.*, 173 F. Supp. 3d 462, 467 (E.D. Tex. 2016) (claims that recite "purely functional steps that purport to solve the problem, and recite standard computer operations to perform some of those steps" are directed to patent ineligible subject matter) (citing *Loyalty Conversion Sys. Corp. v. Am. Airlines, Inc.*, 66 F. Supp. 3d 829, 845 (E.D. Tex. 2014)). Here, the claims are wholly generic, reciting minimal, generic hardware or physical components such as "sensors," "vehicle controls"—that include "engine throttle," "steering mechanism," and "braking system"—a "computer system," a "processor," and a "non-transitory computer readable storage medium." The claims merely recite steps for performing routine functions, such as receiving sensor data and determining the operational state of a system, determining whether corrective action is needed and performing the corrective action. *See Affinity Labs of Texas, LLC, v. DirecTV, LLC*, 838 F.3d 1253, 1262 (Fed. Cir. 2016) (There is no inventive concept where "[t]he claim simply recites the use of generic features of cellular telephones, such as a storage medium and a graphical user interface, as well as routine functions, such as transmitting and receiving signals, to implement the underlying idea."); *Voxathon LLC v. Alpine Electronics of America, Inc.*, 2016 WL 260350 at *5 (E.D. Tex. Jan. 20, 2019) ("Though a computer may be more efficient or less error-prone than a human, mere automation through a generic computer is not enough to render a patent eligible under § 101.") (citing *OIP Techs., Inc. v. Amazon,com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015)).

Claim 4 of the ’402 patent fails to describe how any of its high-level, abstract steps are performed. Instead, “[t]he limitations simply describe the abstract method without providing more.” *Int’l Bus. Machs. Corp. v. Zillow Grp., Inc*., 50 F.4th 1371, 1379 (Fed. Cir. 2022). There is no specialized hardware, no algorithm, nor any other explanation for how the claimed invention carried out any of its abstract steps. For example, claim 4 does not explain how to perform any of the functions listed above. Such broad claim language is a telltale sign of functional claims that add nothing patentable to their underlying abstract ideas. *See Two-Way Media Ltd. v. Comcast Cable Commc’ns*., LLC, 874 F.3d 1329 at 1339 (Fed. Cir. 2017) (invalidating claim that “uses generic functional language to achieve [the alleged invention’s] purported solutions”).

For at least these reasons, the ’402 patent is directed to the abstract idea of gathering, processing, and using data. The patent does not claim any inventive concept sufficient to confer patent eligibility on the claimed abstract idea.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit D-1 contains a chart identifying each exception to eligibility to which each Asserted Claim is directed and the actual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D-1 each Asserted Claim of the ’402 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit D-1 also identifies claim 4 as representative of the other Asserted Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit D-1, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Asserted Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time; and (ii) an

identification of the factual or legal basis for how the claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the '402 patent, the relevant industry was a well-developed industry involving driver assistance systems, and all individual elements disclosed and recited in the '402 patent were conventional, routine, and well known in the video coding industry. *See generally* Exhibits A-1 through A-35. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '402 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '402 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendant's contentions that the Asserted Claims of the '402 patent do not qualify as patent-eligible subject matter are contained in Exhibit D-1.

C. Ineligibility of the '765 Patent

Each of the Asserted Claims of the '765 patent (claims 1, 3-8, 10-20) is directed to subject matter that is not patentable under 35 U.S.C § 101 because they describe generic computer components to perform a process with well-known, functional steps that could be performed by a human without requiring any specific technological improvement. The '765 patent claims are therefore unpatentable for failure to recite patent eligible subject matter.

The '765 patent is titled "Controlling driving modes of self-driving vehicles" and claims computer functionalities for a "[a] computer program product for controlling a driving mode" of an SDV. These receive sensor readings from a plurality of well-known sensors, determine whether a fault has occurred based on the sensor readings, determine whether the fault exceeds a threshold

for danger, determine a corrective action associated with the fault, and implement the corrective action. '765 patent, 1:34-52, 8:07-40. "The computer program product may include a computer readable program medium (or media) having computer readable program instructions thereon for causing a processor to carry out aspects of the present invention." *Id.* at 2:12-27. The patent describes the "computer readable storage medium" as "a tangible device that can retain and store information for use by an instruction execution device," and could be, for example, but not limited to, "an electronic storage device, a magnetic storage device, an optical storage device, an electromagnetic storage device, a semiconductor storage device, or any suitable combination of the foregoing." *Id*. at 2:18-25. The patent goes on to provide "a non-exhaustive list," with numerous more specific examples, of computer readable storage mediums. *Id.* at 2:25-36. The patent similarly provides a non-specific, expansive description of the possible ways the "computer readable program instructions" can be downloaded and the possible form they may take. *Id.* at 2:57-3:17.

In *Alice* Step One, the Court examines the "focus" of the claims and their "character as a whole" to determine if the patent is directed to an abstract idea. *See Elec. Power Grp*., 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Alice*, 573 U.S. at 216, 219 (courts must evaluate whether the patent claims "[o]n their face" are directed to a patent-eligible subject matter). Representative claim 7 purports to claim a computer program product for controlling a driving mode of a SDV with a non-transitory computer storage medium having embodied program code, which is readable and executable by a processor to perform a method of (1) determining a competence level of a human driver in controlling the SDV, (2) receiving sensor readings from a system of sensors about the competence level of the human driver, where the SDV is operable to provide autonomous controls of driver controls, (3) determining a competence level of a processor, (4) determining a corrective

action, and (5) the SDV implementing the corrective action. '765 patent, 23:05-23:22. The "focus" of the '765 patent is directed to a system for gathering and processing data about the vehicle and human driver and using that data to implement a corrective action.

The Federal Circuit has generally found that claims directed to gathering, processing, and using data are directed to abstract ideas. *See, e.g.*, *Bot M8 LLC v. Sony Corp. of Am.*, 4 F.4th 1342, 1358 (Fed. Cir. 2021) (finding a patent directed to gathering, processing, and using data from gaming machines patent ineligible); *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (finding patents directed to systems and methods for performing real-time performance monitoring, collecting data from multiple data sources, analyzing the data, and displaying the results directed to an abstract idea); *iLife Techs. Inc. v. Nintendo of Am., Inc.*, 839 F. App'x 534, 536 (Fed. Cir. 2021) (finding a patent directed to a motion sensor system that evaluates and communicates data patent ineligible. "[T]he essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101." *Elec. Power Grp., LLC*, 830 F.3d 1350 at 1356. Here, claim 7 of the '765 patent is similarly result-focused and functional in nature and contains elements for gathering, processing, and using information to determine whether corrective action is necessary and, if so, carrying out the corrective action. *Symbology Innovations, LLC v. Dexcom, Inc.*, 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) ("These steps do little more than describe the desired outcome. They fail to limit the claims to any particular technological solution that would transform the claims into a patent-eligible invention.").

Moreover, the process claimed in the '765 claims is capable of being performed by a human. For example, a human can (1) determine a competence level of a human driver through observation, (2) receive sensor readings from the system and sensors or observe the conditions

himself by evaluating the vehicle conditions, looking at the road, mirrors and speedometer, (3) determining a competence level of a processor, (4) determine a corrective action using the observed competence level of the processor and the competence level of the human driver, and (5) implement the corrective action such as by pulling over or adjusting vehicle controls. This further demonstrates that they are directed to an abstract idea. *Voter Verified, Inc. v. Election Sys. & Software LLC*, 887 F.3d 1376, 1385 (Fed. Cir. 2018) (claims drawn to fundamental human activity are "nothing more than abstract ideas"); *FairWarning IP, LLC v. Iatric Sys., Inc*., 839 F.3d 1089, 1095 (Fed. Cir. 2019) (system implementing an old practice in a new environment using same rules considered by humans for decades was directed to an abstract idea); *Symbology Innovations, LLC v. Dexcom, Inc*., 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) (finding claims that "can be performed in the human mind, or by a human using a pen and paper" directed to an abstract idea)*; Voxathon LLC v. Alpine Electronics of America, Inc*., 2016 WL 260350 at *3 (E.D. Tex. Jan. 20, 2019) (same).

Under *Alice* Step Two, the '765 patent does not add an inventive step to the abstract idea. For example, claim 7 of the '765 patent does not claim an improvement on functionality or provide a specific technological solution. *See, e.g*., *Recentive Analytics, Inc. v. Fox Corp*., 134 F.4th 1205, 1215-16 (Fed, Cit. 2025) ("patents that do no more than claim the application of generic machine learning to new data environments, without disclosing improvements to the machine learning models to be applied, are patent ineligible under § 101"); *Nexuscard, Inc. v. The Kroger Co*., 173 F. Supp. 3d 462, 467 (E.D. Tex. 2016) (claims that recite "purely functional steps that purport to solve the problem, and recite standard computer operations to perform some of those steps" are directed to patent ineligible subject matter) (citing *Loyalty Conversion Sys. Corp. v. Am. Airlines, Inc*., 66 F. Supp. 3d 829, 845 (E.D. Tex. 2014)). Here, the claims are wholly generic, reciting

minimal, generic hardware or physical components such as "computer program product comprising a non-transitory computer readable storage medium," "driver controls"—including "engine throttle," "steering mechanism," "braking system," and "navigation"—and "a processor." The claims merely recite steps for performing routine functions, such as receiving sensor data and determining and performing a corrective action. *See Affinity Labs of Texas, LLC, v. DirecTV, LLC*, 838 F.3d 1253, 1262 (Fed. Cir. 2016) (There is no inventive concept where "[t]he claim simply recites the use of generic features of cellular telephones, such as a storage medium and a graphical user interface, as well as routine functions, such as transmitting and receiving signals, to implement the underlying idea."); *Voxathon LLC v. Alpine Electronics of America, Inc*., 2016 WL 260350 at *5 (E.D. Tex. Jan. 20, 2019) ("Though a computer may be more efficient or less error-prone than a human, mere automation through a generic computer is not enough to render a patent eligible under § 101.") (citing *OIP Techs., Inc. v. Amazon,com, Inc*., 788 F.3d 1359, 1363 (Fed. Cir. 2015), 788 F.3d at 1363.)).

Claim 7 of the '765 patent fails to describe how any of its high-level, abstract steps are performed. Instead, "[t]he limitations simply describe the abstract method without providing more." *Int'l Bus. Machs. Corp. v. Zillow Grp., Inc*., 50 F.4th 1371, 1379 (Fed. Cir. 2022). There is no specialized hardware, no algorithm, nor any other explanation for how the claimed invention carried out any of its abstract steps. For example, claim 7 does not explain how to perform any of the eight listed above. Such broad claim language is a telltale sign of functional claims that add nothing patentable to their underlying abstract ideas. *See Two-Way Media Ltd. v. Comcast Cable Commc'ns*., LLC, 874 F.3d 1329 at 1339 (Fed. Cir. 2017) (invalidating claim that "uses generic functional language to achieve [the alleged invention's] purported solutions").

For at least these reasons, the ’765 patent is directed to the abstract idea of gathering, processing, and using data. The patent does not claim any inventive concept sufficient to confer patent eligibility on the claimed abstract idea.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit D-2 contains a chart identifying each exception to eligibility to which each Asserted Claim is directed and the actual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D-2 each Asserted Claim of the ’765 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit D-2 also identifies claim 4 as representative of the other Asserted Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit D-2, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Asserted Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time; and (ii) an identification of the factual or legal basis for how the claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the ’765 patent, the relevant industry was a well-developed industry involving driver assistance systems, and all individual elements disclosed and recited in the ’765 patent were conventional, routine, and well known in the video coding industry. *See generally* Exhibits B-1 through B-35. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the ’765 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The ’765

patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendant's contentions that the Asserted Claims of the '765 patent do not qualify as patent-eligible subject matter are contained in Exhibit D-2.

D. Ineligibility of the '004 Patent

Each of the Asserted Claims of the '004 patent (claims 1-24, 29-39) is directed to subject matter that is not patentable under 35 U.S.C § 101 because they describe generic computer components to perform a process with well-known, functional steps that could be performed by a human without requiring any specific technological improvement. The '004 patent claims are therefore unpatentable for failure to recite patent eligible subject matter.

The '004 patent is titled "Controlling driving modes of self-driving vehicles" and claims computer functionalities for a "[a] computer program product for controlling a driving mode" of an SDV. These receive sensor readings from a plurality of well-known sensors, determine whether a fault has occurred based on the sensor readings, determine whether the fault exceeds a threshold for danger, determine a corrective action associated with the fault, and implement the corrective action. '004 patent, 1:39-57, 8:11-44. "The computer program product may include a computer readable program medium (or media) having computer readable program instructions thereon for causing a processor to carry out aspects of the present invention." *Id.* at 2:17-22. The patent describes the "computer readable storage medium" as "a tangible device that can retain and store information for use by an instruction execution device," and could be, for example, but not limited to, "an electronic storage device, a magnetic storage device, an optical storage device, an electromagnetic storage device, a semiconductor storage device, or any suitable combination of the foregoing." *Id*. at 2:18-25. The patent goes on to provide "a non-exhaustive list," with numerous more specific examples, of computer readable storage mediums. *Id.* at 2:23-30. The

patent similarly provides a non-specific, expansive description of the possible ways the "computer readable program instructions" can be downloaded and the possible form they may take. *Id.* at 2:62-3:22.

In *Alice* Step One, the Court examines the "focus" of the claims and their "character as a whole" to determine if the patent is directed to an abstract idea. *See Elec. Power Grp.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Alice*, 573 U.S. at 216, 219 (courts must evaluate whether the patent claims "[o]n their face" are directed to a patent-eligible subject matter). Representative claim 1 purports to claim a computer program product for controlling a driving mode of a SDV with a non-transitory computer storage medium having instructions that, when executed, cause a data processing apparatus to (1) receiving sensor readings from a system of sensors that includes a steering wheel sensor, a speedometer, a GPS system, and a camera, (2) determining a competence level of a human driver and of the SDV, using the sensor readings, (3) comparing the competence levels to a first and second threshold (4) determining whether no fault or a first and/or second fault has occurred, (5) determining a first and/or a second corrective measure (i.e., sounding a warning sound and/or decreasing speed and transfer to manual mode), (6) where no fault occurred, autonomously controlling the driver controls, and (7) taking the first and/or second corrective measure. '004 patent, 21:33-22:11. The "focus" of the '004 patent is directed to a system for gathering and processing data about the vehicle and human driver and using that data to determine whether corrective actions are needed and, if so, implementing the corrective actions.

The Federal Circuit has generally found that claims directed to gathering, processing, and using data are directed to abstract ideas. *See, e.g.*, *Bot M8 LLC v. Sony Corp. of Am.*, 4 F.4th 1342, 1358 (Fed. Cir. 2021) (finding a patent directed to gathering, processing, and using data from gaming machines patent ineligible); *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed.

Cir. 2016) (finding patents directed to systems and methods for performing real-time performance monitoring, collecting data from multiple data sources, analyzing the data, and displaying the results directed to an abstract idea); *iLife Techs. Inc. v. Nintendo of Am., Inc.*, 839 F. App'x 534, 536 (Fed. Cir. 2021) (finding a patent directed to a motion sensor system that evaluates and communicates data patent ineligible. "[T]he essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101." *Elec. Power Grp., LLC*, 830 F.3d 1350 at 1356. Here, claim 1 of the '004 patent is similarly result-focused and functional in nature and contains elements for gathering, processing, and using information to determine whether corrective action is necessary and, if so, carrying out the corrective action. *Symbology Innovations, LLC v. Dexcom, Inc*., 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) ("These steps do little more than describe the desired outcome. They fail to limit the claims to any particular technological solution that would transform the claims into a patent-eligible invention.").

Moreover, the process claimed in the '004 claims is capable of being performed by a human. For example, a human can (1) receive sensor readings from the system and sensors or observe the conditions himself by evaluating the vehicle conditions, looking at the road, mirrors and speedometer, (2) determine a competence level of a human driver and of the SDV through observation, (3) mentally compare the competence levels to thresholds, (4) determine whether fault(s) have occurred through observation and the mental comparison, (5) determine whether a corrective measures are needed or, (6) where no fault, continue to control the driver controls manually, and (7) implement the corrective action(s) by sounding a warning sound and/or decreasing speed. This further demonstrates that they are directed to an abstract idea. *Voter Verified, Inc. v. Election Sys. & Software LLC*, 887 F.3d 1376, 1385 (Fed. Cir. 2018) (claims drawn

to fundamental human activity are "nothing more than abstract ideas"); *FairWarning IP, LLC v. Iatric Sys., Inc*., 839 F.3d 1089, 1095 (Fed. Cir. 2019) (system implementing an old practice in a new environment using same rules considered by humans for decades was directed to an abstract idea); *Symbology Innovations, LLC v. Dexcom, Inc*., 2024 WL 3543409 at *9 (E.D. Tex. July 25, 2024) (finding claims that "can be performed in the human mind, or by a human using a pen and paper" directed to an abstract idea)*; Voxathon LLC v. Alpine Electronics of America, Inc*., 2016 WL 260350 at *3 (E.D. Tex. Jan. 20, 2019) (same).

Under *Alice* Step Two, the '004 patent does not add an inventive step to the abstract idea. For example, claim 1 of the '004 patent does not claim an improvement on functionality or provide a specific technological solution. *See, e.g*., *Recentive Analytics, Inc. v. Fox Corp*., 134 F.4th 1205, 1215-16 (Fed, Cit. 2025) ("patents that do no more than claim the application of generic machine learning to new data environments, without disclosing improvements to the machine learning models to be applied, are patent ineligible under § 101"); *Nexuscard, Inc. v. The Kroger Co*., 173 F. Supp. 3d 462, 467 (E.D. Tex. 2016) (claims that recite "purely functional steps that purport to solve the problem, and recite standard computer operations to perform some of those steps" are directed to patent ineligible subject matter) (citing *Loyalty Conversion Sys. Corp. v. Am. Airlines, Inc*., 66 F. Supp. 3d 829, 845 (E.D. Tex. 2014)). Here, the claims are wholly generic, reciting minimal, generic hardware or physical components such as "computer program product comprising a non-transitory computer readable storage medium," "a data processing apparatus," "sensors"—including "a steering wheel sensor," "a speedometer," a GPS sensor" and "a camera"—and "a display screen." The claims merely recite steps for performing routine functions, such as receiving sensor data, determining whether a fault occurred, and determining and performing corrective action(s). *See Affinity Labs of Texas, LLC, v. DirecTV, LLC*, 838 F.3d 1253,

1262 (Fed. Cir. 2016) (There is no inventive concept where "[t]he claim simply recites the use of generic features of cellular telephones, such as a storage medium and a graphical user interface, as well as routine functions, such as transmitting and receiving signals, to implement the underlying idea."); *Voxathon LLC v. Alpine Electronics of America, Inc*., 2016 WL 260350 at *5 (E.D. Tex. Jan. 20, 2019) ("Though a computer may be more efficient or less error-prone than a human, mere automation through a generic computer is not enough to render a patent eligible under § 101.") (citing *OIP Techs., Inc. v. Amazon,com, Inc*., 788 F.3d 1359, 1363 (Fed. Cir. 2015), 788 F.3d at 1363.)).

Claim 1 of the '004 patent fails to describe how any of its high-level, abstract steps are performed. Instead, "[t]he limitations simply describe the abstract method without providing more." *Int'l Bus. Machs. Corp. v. Zillow Grp., Inc*., 50 F.4th 1371, 1379 (Fed. Cir. 2022). There is no specialized hardware, no algorithm, nor any other explanation for how the claimed invention carried out any of its abstract steps. For example, claim 1 does not explain how to perform any of the functions listed above. Such broad claim language is a telltale sign of functional claims that add nothing patentable to their underlying abstract ideas. *See Two-Way Media Ltd. v. Comcast Cable Commc'ns*., LLC, 874 F.3d 1329 at 1339 (Fed. Cir. 2017) (invalidating claim that "uses generic functional language to achieve [the alleged invention's] purported solutions").

For at least these reasons, the '004 patent is directed to the abstract idea of gathering, processing, and using data. The patent does not claim any inventive concept sufficient to confer patent eligibility on the claimed abstract idea.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit D-3 contains a chart identifying each exception to eligibility to which each Asserted Claim is directed and the actual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D-3 each

Asserted Claim of the ’004 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit D-3 also identifies claim 4 as representative of the other Asserted Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit D-3, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Asserted Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time; and (ii) an identification of the factual or legal basis for how the claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the ’765 patent, the relevant industry was a well-developed industry involving driver assistance systems, and all individual elements disclosed and recited in the ’765 patent were conventional, routine, and well known in the video coding industry. *See generally* Exhibits B-1 through B-35. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the ’004 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The ’004 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendant’s contentions that the Asserted Claims of the ’004 patent do not qualify as patent-eligible subject matter are contained in Exhibit D-3.

V. CONCLUSION

Precise identification of all of the bases upon which the Asserted Claims are invalid and/or unenforceable are likely to be revealed only after further developments in the case, including claim construction and fact and expert discovery. Tesla reserves the right to amend or supplement these

Invalidity Contentions to address any additional invalidity arguments that become apparent in view of any relevant facts and information revealed during discovery.

Dated: June 4, 2024

*/s/ Ashraf Fawzy*_____

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CERTIFICATE OF SERVICE

I certify that I caused the foregoing document, including all exhibits thereto, to be transmitted to counsel for Plaintiff via electronic service on June 4, 2025.

/s/ Maka Stefani
Maka Stefani