UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HAAS, INC.,
Petitioner,

v.

EMERGENCY SAFETY SOLUTIONS, INC.,
Patent Owner.

IPR2027-00016

Patent No. 12,109,938

PETITION FOR INTER PARTES REVIEW

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EXHIBIT LIST

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1001	U.S. Patent No. 12,109,938 ("the '938 Patent")
1002	Declaration of Jason Janét, Ph.D.
1003	Excerpts from Prosecution History of the '938 Patent
1004	U.S. Patent No. 9,805,601 ("Fields")
1005	U.S. Patent No. 9,524,597 ("Ricci")
1006	U.S. Patent No. 8,548,686 ("Pisz")
1007	U.S. Patent Application Publication No. 2013/0141251
1008	Original Complaint (Dkt. 1) in *Emergency Safety Solutions, Inc. v. HAAS, Inc.*, 1:26-cv-00838-GBW (filed July 10, 2026)
1009	Exhibit B to Original Complaint
1010	Patterson et al., "Computer Organization and Design: The Hardware/Software Interface" (4th Ed. 2009)
1011	Stallings, "Computer Organization and Architecture: Designing for Performance" (11th Ed. 2019)
1012	Merriam-Webster Online Dictionary, definition of "heads-up display," *available at* https://www.merriam-webster.com/dictionary/heads-up%20display (last accessed Oct. 13, 2026)
1013	U.S. Patent Application Publication No. 2014/0269542
1014	U.S. Patent No. 9,544,758
1015	Webster's New World College Dictionary (4th Ed. 1999), definition of "microprocessor"
1016	U.S. Patent Application Publication No. 2014/0368324 ("Seifert")

Exhibit No.	Description
1017	U.S. Patent Application Publication No. 2007/0096892
1018	BMW Group, "BMW 5 Series/Head-Up Display (04/2003)," *available at* https://www.press.bmwgroup.com/global/photo/detail/P0010346/bmw-5-series/head-up-display-04/2003?language=en (last accessed Oct. 16, 2026)
1019	Petitioner's *Sotera*-plus Stipulation of Oct. 19, 2026

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MANDATORY NOTICES (37 C.F.R. § 42.8)

42.8(b)(1)—Real Party-in-Interest

The only real party-in-interest is HAAS, Inc. ("HAAS" or "Petitioner").

42.8(b)(2)—Related Matters

Emergency Safety Solutions, Inc. v. HAAS, Inc., C.A. No. 1:26-cv-00838-GBW (D. Del.), filed July 10, 2026, asserts the '938 Patent.

42.8(b)(3)—Lead and Back-Up Counsel

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HAAS has filed a Power of Attorney concurrently with this petition.

42.8(b)(4)—Service Information

Petitioner consents to electronic service by e-mail sent to: Stephen@CHZFirm.com; JGlenn@CHZFirm.com; James@CHZFirm.com;

Steve@CHZFirm.com; Paralegal@CHZFirm.com. Service by mail or hand delivery may be made on HAAS at Cabello Hall Zinda, PLLC, 801 Travis, Suite 1610, Houston, Texas 77002. The fax number for HAAS's counsel is (832) 631-9991.

Proof of service of this petition and exhibits is provided in the appended certificate of service.

I. INTRODUCTION

Petitioner requests *inter partes* review of claims 1–8 (the "Challenged Claims") of U.S. Patent No. 12,109,938 ("the '938 Patent"). It broadly claims a server that alerts a second vehicle of the location of a first vehicle in a hazardous condition if the vehicles are determined to be "on a common roadway path and within a predetermined distance" of one another. There is nothing novel about this concept—it was clearly disclosed in the prior art before the earliest priority date of the '938 Patent. As such, the Challenged Claims are unpatentable and should be cancelled.

II. STANDING (37 C.F.R. §§ 42.101 & 42.104(a))

HAAS certifies that the '938 Patent is available for *inter partes* review and HAAS is not barred or estopped from requesting *inter partes* review of the Challenged Claims.

III. FEES (37 C.F.R. § 42.103)

The undersigned authorizes the Commissioner to charge the fee specified by 37 C.F.R. § 42.15(a) to Deposit Account No. 603139, referencing docket number 364-102. Any additional required fees may be charged, and any overpayments may be credited, to the same account.

IV. IDENTIFICATION OF CHALLENGE (37 C.F.R. § 42.104(b))

A. § 42.104(b)(1), (b)(2) Statement of Requested Relief

HAAS requests institution and cancellation of claims 1–8 of the '938 Patent in view of Grounds 1–4 below. Because the earliest possible priority date of the '938 Patent is August 12, 2019, the America Invents Act applies.

Ground	Claims	Basis	References
1	1–4, 6	§§ 102/103	Fields (Ex. 1004)
2	1–4, 6	§ 103	Fields in view of Pisz (Ex. 1006)
3	5	§ 103	Fields (with or without Pisz) in view of Ricci (Ex. 1005)
4	7, 8	§ 103	Fields (with or without Pisz) in view of Seifert (Ex. 1016)

B. § 42.104(b)(4): Unpatentability

Claims 1–8 are unpatentable as detailed in Sections V–VII below.

C. § 42.104(b)(5): Supporting Evidence

The relevance of HAAS's evidence, including the identification of specific evidence that supports this challenge, is found in Sections V–VII below.

V. THE '938 PATENT

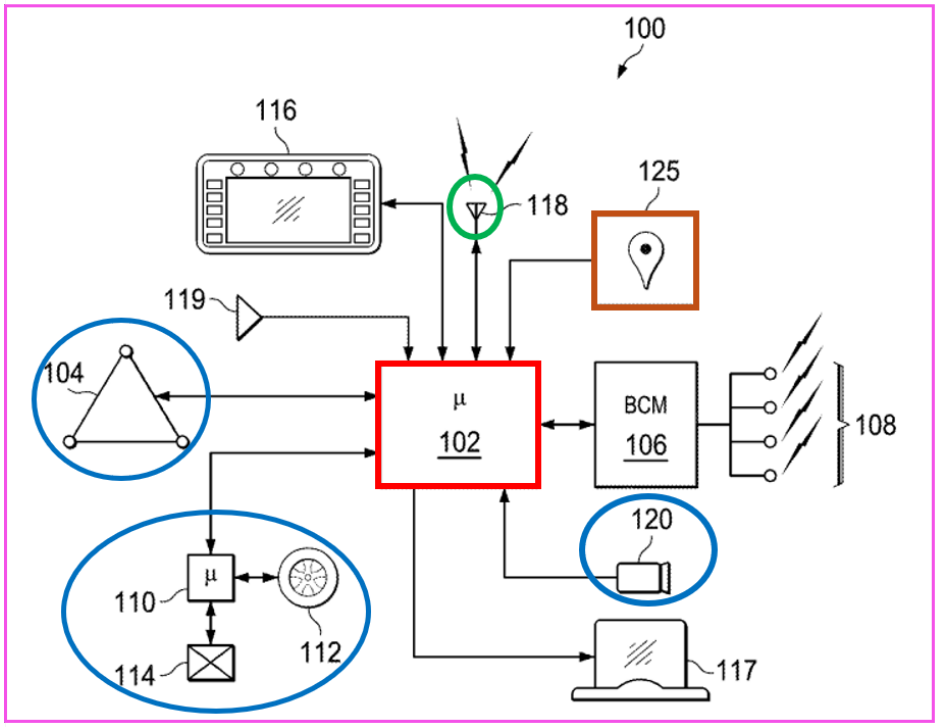
A. Overview

The '938 Patent, titled "System for Communication of Hazardous Vehicle and Road Conditions," was filed on August 12, 2020, and issued on October 8, 2024.

Ex. 1001. The '938 Patent claims priority to provisional application No. 62/885,659, filed August 12, 2019. *Id.*

The '938 Patent is directed to a system for relaying hazard information between vehicles. Figure 1 (annotated below) depicts an embodiment of a hazard detection system 100 (**pink**) that is installed in a vehicle. *Id.*, 5:1–5.

Ex. 1001, FIG. 1 (Annotated)



The system's microprocessor 102 (**red**) is configured to receive information from various hazard-indicating elements (**blue**), including hazard switch 104 (*id.* at 5:61–62), forward-looking camera or radar 120 (*id.* at 6:59–67), and airbag monitoring system 110 (*id.* at 6:50–52, 8:7–15). Microprocessor 102 obtains the vehicle's position from GPS unit 125 (**brown**) (*id.* at 7:61–8:3) and can communicate with the

outside world via antenna 118 (**green**). *Id.*, 7:53–60.

In Figure 2, a first vehicle 202 (**red**) equipped with system 100 (**pink**) experiences a hazardous condition (e.g., a collision) and communicates its location and hazard status via a "network … represented here by tower 210" (**purple**) or "satellite network 216" (**green**). *Id.*, 8:61–64, 9:15–33, 9:43–67.

Ex. 1001, FIG. 2 (Annotated)

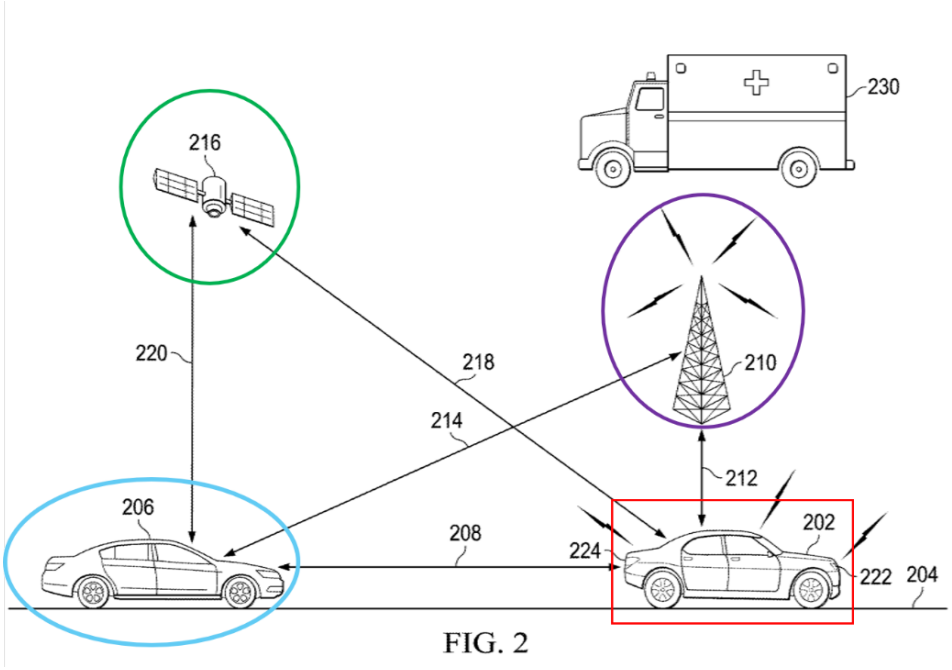


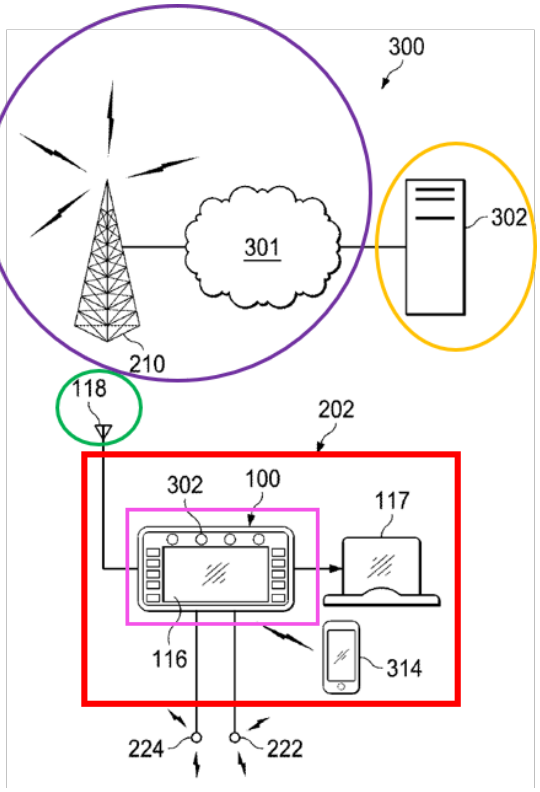
FIG. 2

Through the network, first vehicle 202 communicates with second vehicle 206 (**blue**) to provide a hazard alert to the second vehicle if certain predetermined requirements are satisfied (e.g., the vehicles are within a certain distance of one another), as discussed further below. *Id.*, 9:7–18, 9:43–59.

The Challenged Claims relate to the embodiment of Figure 3, which is similar to the Figure 2 embodiment except that a server is relied upon to communicate

between vehicles. *See id.* at 10:17–19 ("The system 300 shares the vehicle installed components with the system 100…."). Specifically, as shown in annotated Figure 3 below, the system 100 (**pink**) is in vehicle 202 (**red**) and may use the antenna 118 (**green**) to communicate with server 302 (**orange**) through the Internet 301 via tower 210 (**purple**). *Id.*, 10:15–21, 10:30–33, 10:39–58.

Ex. 1001, FIG. 3 (Annotated)



As the specification explains:

> The network 210 may send and receive communications to and from the vehicle 202 and other vehicles as previously described … Data from the vehicle 202 is ultimately provided to a data server 302. The server 302 may track vehicles based upon GPS location or other data. ***Thus the server 302 may then discriminate as to which other vehicles any***

> ***received hazard or emergency condition notification should be relayed to***.

Ex. 1001, 10:39–49.[1] Thus, the server knows the locations of the first and second vehicles, receives an indication of a hazardous condition from the first vehicle, and alerts the second vehicle if one or more predetermined conditions are satisfied. Those conditions may include a threshold distance between the vehicles and whether the vehicles are on a common roadway path. *Id.*, 3:47–60, 4:4–9, 10:45–49, 12:35–67, 13:4–17.

Independent claim 1 is annotated below to show how it corresponds to the embodiments of Figures 1–3 discussed above:

> 1. **[Preamble]** A system for providing real time indication of a hazardous vehicle condition comprising:
>
> **[1.1]** a server [**element 302**, FIG. 3] in communication with a first microprocessor [**element 102**, FIG. 1] of a first vehicle [**element 202**, FIGS. 2 and 3], the first microprocessor operative to receive a first communication sent from the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle;
>
> **[1.2]** wherein the server [**element 302**, FIG. 3] receives a second communication sent from a second vehicle [**element 206**, FIG. 2]

[1] All ***bold-italics*** emphasis and alterations herein are added unless otherwise indicated.

> to the server indicative of a location of the second vehicle; and
>
> **[1.3]** wherein the server [**element 302**, FIG. 3] provides a third communication to the second vehicle [**element 206**, FIG. 2] when it is determined that the locations of the first and second vehicle lie on a common roadway path and within a predetermined distance of one another.

Id., 14:51–65.

B. Prosecution History

U.S. Patent Application No. 16/991,595 is the nonprovisional application that issued as the '938 Patent and was filed on August 12, 2020. The nonprovisional application claims the benefit of provisional application No. 62/885,659, filed on August 12, 2019. Ex. 1001, 1. The Challenged Claims (claims 1–8) were originally presented as claims 26–28, 30–33, and 35. Ex. 1003, 36, 664–66. In its original form, claim 26 (which became claim 1) was directed to embodiments in which "the first microprocessor [is] operative to receive a signal from the first vehicle indicating a hazardous condition; wherein the server receives the indication of the hazardous condition from the first microprocessor and provides the indication to a second vehicle." *Id.*, 664. Thus, the claim originally required the first vehicle's microprocessor to receive a signal from another component within the vehicle (e.g., an airbag sensor) indicating a hazardous condition.

During prosecution, claims 26–28, 30–33, and 35 were rejected as obvious

(*id.*, 412, 414–17, 427–34) and amended. In attempting to distinguish the cited prior art, the applicant specifically argued that "the claimed system provides alerts based on *vehicle* hazards before they are necessarily road hazards, and before they have necessarily become an immediate or near immediate threat." *Id.*, 388 (emphasis in original). Additionally, claim 26 was amended to add, *inter alia*, that "the server provides a third communication to the second vehicle when it is determined that the locations of the first and second vehicle lie on a common roadway path and within a predetermined distance of one another." *Id.*, 387.

When these claims were again rejected as obvious (*id.*, 334), the applicant argued that the "claimed server receives both an indication of a hazard condition and a location of the transmitting vehicle because the claimed ***server was the intended recipient***." *Id.*, 328. The applicant also amended claim 26 as follows:

> 26. (Currently amended) A system for providing real time indication of a hazardous vehicle condition comprising:
>
> a server in communication with a first microprocessor of a first vehicle, the first microprocessor operative to receive a first communication sent from the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle;
>
> wherein the server receives a second communication sent from a second vehicle to the server indicative of a location of the second vehicle; and
>
> wherein the server provides a third communication to the second vehicle when it is determined that the locations of the first and second vehicle lie on a common roadway path and within a predetermined distance of one another.

Id., 325.

Thus, the directionality of communications with the server was more specifically claimed.

While the amendment was intended to emphasize that the server is the intended recipient of the first communication, the resulting language as written is slightly awkward. This is because it states that the first microprocessor receives a communication "sent" to the server. A POSITA (as defined *infra* Section V.C) would understand the phrase to mean that the microprocessor is operative to receive a hazardous condition indication and location of the first vehicle for a communication to the server. Ex. 1002, ¶72. This is consistent with the specification, which explains that microprocessor 102 acquires information from the hazard-indicating elements (e.g., airbag monitoring system 110) and GPS unit 125 of first vehicle 202 indicating that it is in a hazardous condition and the vehicle's location and sends a message to the server indicating the first vehicle's location and hazardous condition (Ex. 1001, 3:43–47, 5:61–62, 6:50–52, 7:13–19, 7:61–64, 8:7–11, 10:43–45, 12:36–40)—i.e., "the first microprocessor [is] operative to receive a first communication sent from the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle." This is also consistent with the abstract, which states that "[i]n response to receiving ***the signal indicative of a hazardous event***, the microprocessor ***sends a first wireless signal*** via

the first radio transmitter that indicates the vehicle is involved in the hazardous condition." Ex. 1001, Abstract.

C. Level of Ordinary Skill in the Art

A person having ordinary skill in the art ("POSITA") as of August 12, 2019—the earliest possible priority date of the '938 Patent—would have had a bachelor's degree in electrical engineering, computer science, mechanical engineering, or a related discipline and at least two years of experience working with networked electronics, such as mobile phones and transceivers. Ex. 1002, ¶¶73–74.[2] More education can supplement practical experience and vice versa. *Id.* Petitioner relies on the expert testimony of Dr. Jason Janét, who exceeds the level of ordinary skill in the art. *Id.,* ¶75.

D. Claim Construction (37 C.F.R. § 42.104(b)(3))

Patent claims in IPR proceedings are construed according to the *Phillips* standard—*i.e.*, their ordinary and customary meaning as understood by a POSITA in the context of the specification and prosecution history. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (*en banc*). However, "claim terms need only be construed 'to the extent necessary to resolve the controversy.'" *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed.

[2] Petitioner takes no position on whether the '938 Patent is entitled to the August 12, 2019 priority date, because the asserted prior art applies regardless.

Cir. 2011) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Because of its awkward phrasing, Petitioner proposes that the plain and ordinary meaning of "the first microprocessor operative to receive a first communication *sent from* the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle" (element [1.1]) would be understood by a POSITA to mean that the microprocessor is operative to receive a hazardous condition indication and location of the first vehicle for a communication to the server. Ex. 1002, ¶87. A POSITA would understand that it makes no technical sense for the microprocessor to receive a communication that was already "sent" to the server, and so this is the only reasonable interpretation of this limitation. *Id*. This clarification is consistent with both the specification and the express claim language. For example, the specification explains that microprocessor 102 acquires information from the hazard-indicating elements (e.g., airbag monitoring system 110) and GPS unit 125 of first vehicle 202 indicating that it is in a hazardous condition and the vehicle location and sends a communication to the server indicating the first vehicle's location and hazardous condition. *Id*. (citing Ex. 1001, 3:43–47, 5:61–62, 6:50–52, 7:13–19, 7:61–64, 8:7–11, 10:43–45, 12:36–40). This is also consistent with the abstract, which states that "[i]n response to receiving ***the signal indicative of a hazardous event***, the microprocessor sends a first wireless

signal via the first radio transmitter that indicates the vehicle is involved in the hazardous condition." Ex. 1001, Abstract.

Petitioner submits that no other terms require construction for purposes of this proceeding.[3] Petitioner reserves the right to respond to any claim construction issues raised by Patent Owner.

VI. OVERVIEW OF APPLIED PRIOR ART

A. Fields

1. Fields Is Prior Art

U.S. Patent No. 9,805,601 (Ex. 1004, "Fields"), titled "Vehicular Traffic Alerts for Avoidance of Abnormal Traffic Conditions," was filed on August 19, 2016, and issued on October 31, 2017. Ex. 1004. Because the '938 Patent's earliest possible priority date is August 12, 2019 (the filing date of the provisional application), Fields qualifies as prior art under 35 U.S.C. § 102(a)(1)–(2).

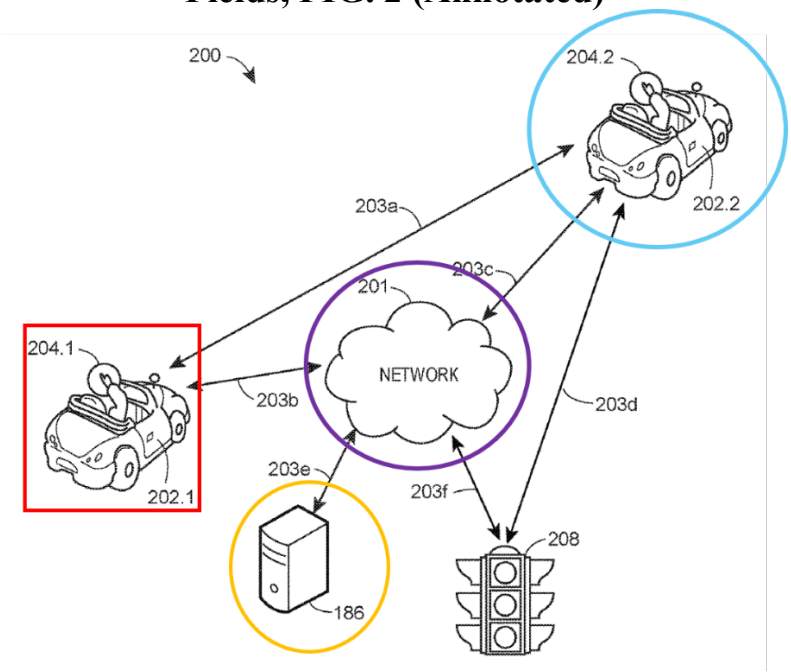
2. Overview of Fields

Fields discloses a comprehensive system for generating and communicating vehicular traffic alerts to help vehicles avoid abnormal traffic conditions and vehicle accidents. Ex. 1004, Abstract; *id.*, 2:53–56. As shown in Figure 2, Fields, like

[3] Petitioner notes below that claims 4, 6, and 7 erroneously depend on claim 1 when they were clearly intended to depend on claim 2. However, the prior art renders those claims unpatentable as written or as corrected, and thus construction is unnecessary.

the ’938 Patent, discloses first vehicle 202.1 (**red**) and second vehicle 202.2 (**blue**) communicating with server 206/186 (**orange**) through network 201 (**purple**). *Id.*, 9:36–42, 11:38–44.

Fields, FIG. 2 (Annotated)

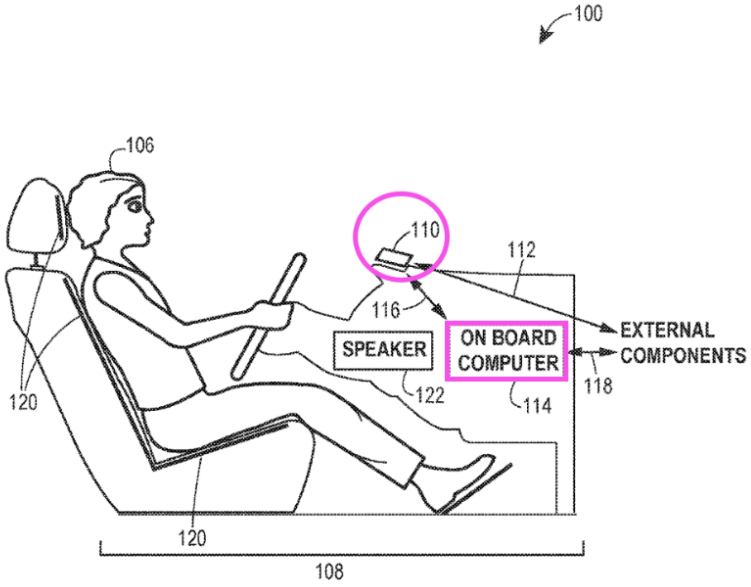


Notably, the “external computing device” is labeled “186” in the figure, but a POSITA would understand that label to be a drafting error referring to element “206,” the “external computing device,” because no component “186” is referenced in the specification and only discussed component “206” matches that component’s functionality. Ex. 1002, ¶78 (citing Ex. 1004, 9:36–42, 10:31–34, 11:40–44). The Fields specification never mentions element “186” but repeatedly references “external computing device 206” with respect to Figure 2. *See, e.g.*, Ex. 1004, 9:36–42, 9:53–64, 10:31–34. Indeed, the specification states that “smart infrastructure

component 208 may communicate with external computing device 206 **via links 203e and 203f utilizing network 201**"—a function that only the computing device labeled 186 can perform. Ex. 1004, 12:2–5; *see also id.* at 10:31–34.

To accomplish the communication above, Fields teaches that each vehicle 202 may have a telematics collection system 100 comprising a mobile computing device 110 and/or on-board computer 114 (**pink** below):

Fields, FIG. 1 (Annotated)



Id., 7:56–61. Telematics and communication functions can be performed by mobile computing device 110, by on-board computer 114, or by both devices in coordination with one another. *Id.*, 8:8–9:15.

In describing Figure 3, Fields provides specific details of computing device 300 (**pink**), which "may be implemented as … a mobile computing device (e.g.,

mobile computing device 100, as shown in FIG. 1)"[4] or "as an on-board vehicle computer (e.g., on-board vehicle computer 114, as shown in FIG. 1)." *Id.*, 12:60–66.

Fields, FIG. 3 (Annotated)

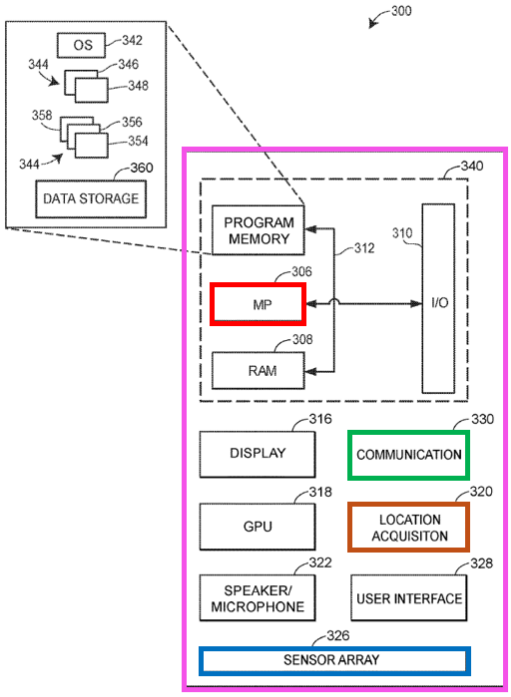


FIG. 3

As shown, device 300 has a controller 340 that includes a microprocessor 306 (**red**) in communication with sensors (**blue**). Those sensors gather telematics data from sources such as cameras, accelerometers, gyroscopes, magnetometers, and airbag sensors, which the system can use to identify an anomalous condition, such as an airbag deployment or rollover indicating that the vehicle has been in an accident. *Id.*, 13:31–38, 16:10–26, 17:46–53, 19:44–63. Location acquisition unit 320 (**brown**)

[4] This erroneously refers to mobile computing device "100," rather than intended element "110" as shown in Figure 1. Ex. 1002 ¶80 n.2.

may rely on GPS to track the vehicle's location. *Id.*, 15:36–59. Thus, computing device 300 is configured to communicate with external components of the system (*id.*, 8:3–7, 8:13–15), receive signals indicating airbag deployment and crash detection (*id.*, 8:54–59) and location data (*id.*, 8:48–54), and transmit those signals to external computing device 206 (*id.*, 20:51–56, 48:23–29, 48:55–59).

In a passage relevant to the Challenged Claims, Fields teaches:

> The geographic relationship between two or more devices 300 may be utilized in several ways to determine the relevance of the anomalous condition. For instance, current speed, location, route, destination, and/or direction of travel of a first vehicle (collecting and/or associated with the telematics data) may be individually or collectively compared with current speed, location, route, destination, and/or direction of travel of a second vehicle traveling on the road.
>
> ***
>
> The external computing device may determine, from telematics data and geographic location data received from a first computing device 300, that a first vehicle is located on a highway at a certain geographic location. ***If the external computing device determines that a second computing device 300 in a vehicle travelling on the same highway is within a threshold distance approaching the first vehicle, then the external computing device may issue an alert notification to the second vehicle***.

Id., 20:51–21:15, 21:36–54. Thus, Fields teaches that computing device 300 (which may be implemented as the on-board computer) of a first vehicle collects data related

to the vehicle's hazardous condition (e.g., airbag deployment (Ex. 1004, 19:47–50)) and location and provides that data to external computing device 206 (*e.g.*, a server). External computing device 206 then obtains location information for surrounding vehicles and determines whether to notify those vehicles of the first vehicle's hazardous condition based on, *inter alia*, whether a surrounding vehicle is within a threshold distance of the first vehicle and/or traveling on the same highway as the first vehicle. Ex. 1002, ¶81.

B. Pisz

1. Pisz Is Prior Art

U.S. Patent No. 8,548,686 (Ex. 1006, "Pisz"), titled "Automatic Crash Notification Using WiMAX," was filed on October 11, 2007, and issued on October 1, 2013. Ex. 1006. Because the '938 Patent's earliest possible priority date is August 12, 2019, Pisz qualifies as prior art under 35 U.S.C. § 102(a)(1)–(2).

2. Overview of Pisz

Pisz is directed to an "automatic crash notification system" that may include a "crash detection system configured to detect a crash of a vehicle" and a "wireless communication system configured to wirelessly transmit a message to and wirelessly receive a message from a remote location." Ex. 1006, Abstract. The system may include processing system 101, which may "have only a single processor" (*id.* at 6:8–10), that may "receive notice of" a crash from the crash detection system 103

(*id.* at 6:40–43) and then "cause the wireless communication system 105 to transmit notice of the crash to a call center at a remote location" (*id.* at 6:55–58), along with "information about the location of the vehicle at the time of the crash" that the processor obtained from location detection system 111 (*id.* at 7:11–16). Ex. 1002, ¶82.

C. Ricci

1. Ricci Is Prior Art

U.S. Patent No. 9,524,597 (Ex. 1005, "Ricci"), titled "Radar Sensing and Emergency Response Vehicle Detection," was filed on April 15, 2014, and issued on December 20, 2016. Ex. 1005. Because the '938 Patent's earliest possible priority date is August 12, 2019, Ricci qualifies as prior art under 35 U.S.C. § 102(a)(1)–(2).

2. Overview of Ricci

Ricci is directed to a "method for communication of safety information comprising: detecting at least one road hazard; categorizing the at least one road hazard; associating a GPS coordinate with the road hazard; and forwarding information about the road hazard to one or more entities." Ex. 1005, 8:56–62. Ricci discloses that "the information is communicated ***directly to one or more other drivers*** based on the one or more other driver's proximity to the road hazard" and that the road hazard may be "an accident." *Id.*, 9:4–11. Ricci also discloses that alerts, such as an alert about the presence of an emergency vehicle, may be provided

to nearby vehicles in a "heads-up display" of those vehicles. *Id.*, 10:58–11:13, 96:57–58 (claim 6), 97:24–25 (claim 12); Ex. 1002, ¶83.

D. Seifert

1. Seifert Is Prior Art

U.S. Patent Application Publication No. 2014/0368324 (Ex. 1016, "Seifert"), titled "Rear End Collision Prevention Apparatus," was filed on June 17, 2013, and published on December 18, 2014. Ex. 1016. Because the '938 Patent's earliest possible priority date is August 12, 2019, Seifert qualifies as prior art under 35 U.S.C. § 102(a)(1)–(2).

2. Overview of Seifert

Seifert is directed to a "rear end collision apparatus" with "a first warning light to capture a driver's attention indicating a slow down or stop event is about to occur or is occurring and re-focuses a drivers' visual attention point" and "a different type of second warning light indicating the vehicle has not yet started re-accelerating after a slowing or stop event." Ex. 1016, Abstract. The first warning light may be "a ***very bright, directional strobe light***," and the second may also be a strobe. *Id.* ¶¶[0112]–[0113], [0128]. The lights are "installed in a ***rear portion*** of the vehicle" to be visible to the vehicle "directly behind," and may be integrated into the stop lamp or brake lights. *Id.* ¶¶[0139]–[0142], claim 1; Ex. 1002, ¶84.

Seifert's lights activate automatically upon detection of a hazard ahead—*e.g.*,

when front end monitor 22 detects that vehicle 28 "comes within a certain distance of any vehicle in front of it"—or upon an emergency event. Ex. 1016 ¶¶[0106], [0108], [0156]–[0157]. In Figure 10, vehicle 28, approaching a vehicle ahead, activates its rear strobe so that it is visible to following vehicle 30. *Id.* ¶[0177], FIG. 10.

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

As shown below, claims 1–8 are unpatentable pursuant to Grounds 1–4.

A. Ground 1: Fields Anticipates or Renders Obvious Claims 1–4 and 6.

Fields anticipates all elements of these Challenged Claims. Petitioner alternatively asserts obviousness based on Fields for two reasons.

First, to the extent it is argued that Petitioner is relying on distinct embodiments from Fields for anticipation, it would have been obvious to combine those embodiments as proposed. *Infra* Section VII.A.1.[1.0].b; Ex. 1002, ¶100.

Second, to the extent it is argued that Fields does not anticipate "the first microprocessor operative to receive a first communication sent from the first vehicle to the server" (element [1.1]), that limitation would have been obvious based on Fields in view of the general knowledge of a POSITA. *Infra* Section VII.A.1.[1.1]; Ex. 1002, ¶101.

1. Claim 1

[1.0] (Preamble): "A system for providing real time indication of a hazardous vehicle condition comprising:"

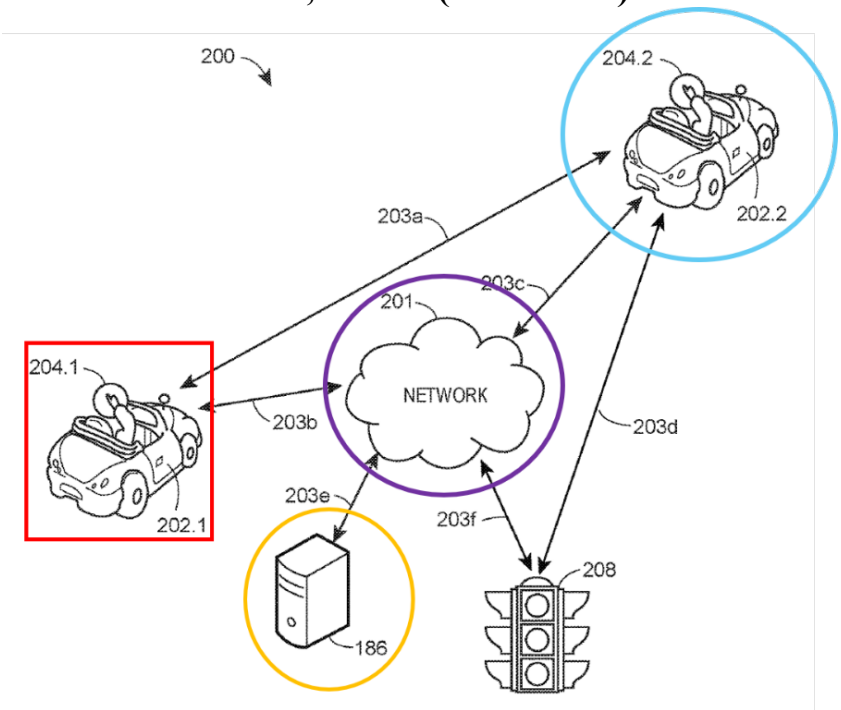
To the extent the preamble is limiting, Fields teaches it.

a. Fields Teaches a Single Embodiment With All Relevant Features.

The claim mappings that follow are drawn from a single, continuous disclosure in Fields: the server-mediated alert-notification system illustrated in FIGS. 1–3 and 11 and described in the accompanying text, including the geographic-relationship discussion. Ex. 1002, ¶103.

As shown in Figure 2 below, Fields discloses a system 200 for providing real-time indication of a "hazardous vehicle condition" that includes first vehicle 202.1 (**red**) and second vehicle 202.2 (**blue**). *Id.* ¶104.

Fields, FIG. 2 (Annotated)



Specifically, Fields describes an "alert notification system 200" that includes "N" vehicles 202.1–202.N, external computing device 206 (e.g., a server, **orange**),[5] and network 201 (**purple**) for detecting and communicating about abnormal traffic conditions—including hazardous vehicle conditions—in real time. Ex. 1004, 9:35–65 (describing alert notification system 200 as including network 201 interconnecting external computing device 206 with one or more vehicles 202 and their respective mobile computing devices 204, each vehicle also having an associated on-board computer 114). Fields teaches that "FIG. 2 illustrates a block diagram of an ***exemplary*** alert notification system 200 in accordance with an ***exemplary*** aspect of the present disclosure." *Id.,* 9:35–38.

Figures 11 and 12 illustrate a method "of determining, generating, transmitting, receiving, and presenting ***alerts or notifications related to anomalous or abnormal conditions***." *Id.*, 46:54–56; Ex. 1002, ¶105.

[5] As discussed in Section VI.A.2 above, "external computing device" 206 is incorrectly labeled in FIG. 2 of Fields as element "186."

Fields, FIG. 11 (Annotated)

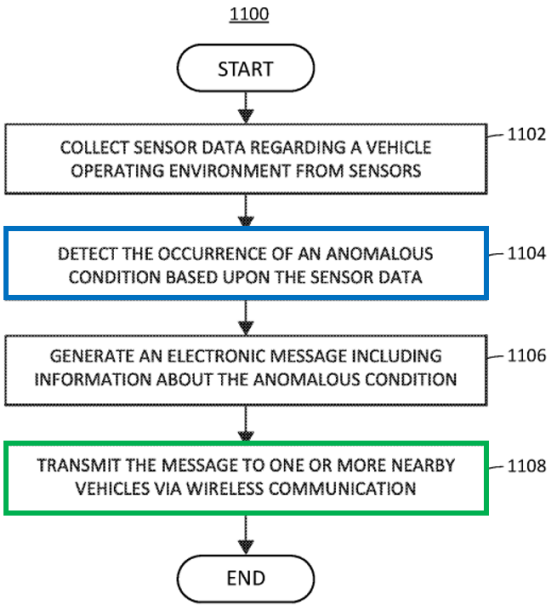


FIG. 11

Although the method is "described as being performed by mobile computing devices 110 and/or on-board computers 114 associated with vehicles," Fields explains that "vehicle 108 may similarly transmit the electronic message ***to an external computing device 206 via the network 201***, which external computing device 206 may ***redirect the electronic message to appropriate vehicles 202*** via the network 201." Ex. 1004, 46:61–64, 48:55–59; *see also id.*, 46:54–67 ("[S]ome embodiments may instead perform some or all actions using one or more external computing devices 206, such as ***servers communicatively connected to the vehicles via the network 201***"). Figure 1 depicts mobile computing device 110 and on-board computer 114, and Figure 3 depicts details of a computing device 300, which Fields teaches "may be implemented as" the mobile computing device or on-board

computer of Figure 1, and which comprises a microprocessor. *Id.*, 12:58–13:2; 13:31–32.

Fields further teaches that these systems are capable of performing the above "exemplary traffic condition broadcast method 1100." Ex. 1004, 46:54–47:4. Fields specifically discloses collecting sensor data (step 1102) and detecting an "anomalous condition" (step 1104, **blue**) based on that sensor data (*id.* at 47:53–55), where "an anomalous condition may be identified when the one or more sensor metrics indicate **that an airbag has been deployed**, and thus the vehicle associated with computing device 300 **has been in an accident**" (*id.* at 19:47–50). The anomalous condition may also be "sensor metrics indicative of a ***rollover condition***, [or] a sudden stop (***indicating a collision***)." *Id.*, 19:55–63. With respect to Figure 6, Fields teaches that the computing device "may process the data in ***real-time*** as it is received to determine whether an anomalous condition has occurred …." *Id.*, 34:23–29; *see also id.*, 6:20–33; *id.*, 19:40–43. The system then generates (step 1106 above) and transmits (step 1108, **green**) electronic messages regarding detected hazardous conditions to external computing device 206 (the server). *Id.*, 48:23–64. The system thus provides a "real time indication of a hazardous vehicle condition," such as an airbag deployment or vehicle rollover. Ex. 1002, ¶106.

Although Fields describes its teachings with reference to multiple figures and "aspects," Fields makes clear that these are not discrete, mutually exclusive

inventions but complementary features of a single, integrated alert notification system that a POSITA would at once envisage operating together. *Id.,* ¶107. Fields itself repeatedly instructs that its features are to be combined. For example, in its concluding remarks, Fields states that "[t]hose of ordinary skill in the art will recognize that a ***wide variety of modifications, alterations, and combinations can be made with respect to the above described embodiments*** … and … such modifications, alterations, and ***combinations are to be viewed as being within the ambit of the inventive concept***." Ex. 1004, 74:24–29. Fields likewise explains that "[s]tructures and functionality presented as separate components in example configurations ***may be implemented as a combined structure or component***," and that "[t]hese and other variations, modifications, additions, and improvements fall within the scope of the subject matter herein." *Id.*, 72:47–53. A POSITA would thus understand Fields' teachings concerning complementary aspects of the various figures discussed herein to comprise a single embodiment and would immediately "envisage" the claimed arrangement or combination. *See Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1086 (Fed. Cir. 2017); *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1344 (Fed. Cir. 2016) ("[A] reference may still anticipate if that reference teaches that the disclosed components or functionalities may be combined and one of skill in the art would be able to implement the combination.").

b. Alternatively, the Combination of Features into a Single Embodiment Would Have Still Been Obvious.

Alternatively, even if it is found that any of the teachings of Fields relied upon herein are drawn from separate embodiments, it would have been obvious to a POSITA to combine those teachings into a single system. Ex. 1002, ¶108. Obviousness may be based on a single reference where a POSITA would have been motivated to combine its teachings with a reasonable expectation of success. *See Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016); *Boston Sci. Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991 (Fed. Cir. 2009) (explaining that combining embodiments of a single reference was obvious and did "not require a leap of inventiveness"). Because the motivation and reasonable expectation of success are supplied by Fields itself, this is a straightforward case.

The combined system consists of: (1) telematics collection system 100 of Figure 1, in which mobile computing device 110 and/or on-board computer 114 in each vehicle collect telematics data and generate alerts (Ex. 1004, 7:56–9:15); (2) alert notification system 200 of Figure 2, in which vehicles 202.1–202.N communicate via network 201 with external computing device 206, implemented as a server (*id.* at 9:35–11:49); (3) computing device 300 of Figure 3, including microprocessor 306/controller 340, sensor array 326, location acquisition unit 320, communication unit 330, display 316, and speaker 322, together with the anomalous-condition detection and threshold-distance/same-road relevance determinations

performed by device 300 when implemented as the external server (*id.* at 12:58–21:54); and (4) traffic condition broadcast method 1100 of Figure 11, which detects an anomalous condition from sensor data (e.g., airbag deployment or rollover) and transmits an electronic message to external computing device 206 for redirection to appropriate vehicles (*id.* at 46:54–48:64). Ex. 1002, ¶109.

A POSITA would have been motivated to combine these features for at least four reasons. First, Fields expressly instructs that its embodiments be combined: "a wide variety of modifications, alterations, and ***combinations can be made with respect to the above described embodiments***," and "such modifications, alterations, and ***combinations are to be viewed as being within the ambit of the inventive concept***." Ex. 1004, 74:24–29. Fields further teaches that "[s]tructures and functionality presented as separate components in example configurations may be implemented as a combined structure or component." *Id.,* 72:47–53. An express suggestion in the reference itself is a strong motivation to combine, particularly where the features being combined are complementary and their combination would predictably advance Fields' expressly stated objectives. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–18, 420 (2007); Ex. 1002, ¶110.

Second, the features are functionally interdependent and complementary, such that each figure supplies a piece from which the others benefit and, in some instances, upon which they rely. Figure 2's alert notification system needs the

vehicle-side devices of Figure 1 to generate the data it relays, and Fields states that each vehicle may have a mobile computing device 110 and/or on-board computer 114 to accomplish this purpose. Ex. 1004, 7:56–61, 9:36–52. Figure 3's computing device 300 is described as the implementation of those very devices—the mobile device 110 and on-board computer 114. *Id.,* 12:60–13:2. Figure 11's method is performed by those same components. *Id.,* 46:54–67. Indeed, Fields' single alert notification application 346 installs the telematics collection, location determination, and anomalous-condition detection routines together to execute "one or more embodiments described herein." *Id.,* 17:64–18:20. A POSITA implementing any one of these figures would naturally have looked to the others to supply the components and steps that Fields describes them as using. Ex. 1002, ¶111.

Third, Fields identifies specific benefits that are achieved only by using the server-based architecture of Figures 2 and 3 with the vehicle-side detection of Figures 1 and 11. Fields teaches that vehicle devices may "send the data to external computing device 206 for remote processing instead of processing the data locally" (Ex. 1004, 11:50–62), that a mobile device may route alerts through other components "to conserve battery power of the mobile device" (*id.* at 7:8–15), and that the server's road-based relevance determination "may prevent false alert notifications from being sent to other vehicles travelling in close proximity to the first vehicle, but on nearby roads unaffected by the detected anomalous condition"

(*id.* at 22:43–47). A POSITA seeking these stated benefits—reduced processing and power burden on vehicle devices and more accurate, targeted alerts—would have been motivated to have the vehicle-side detection of Figure 11 feed the server-based relevance determination of Figures 2 and 3. Ex. 1002, ¶112.

Fourth, the combination is nothing more than "the combination of familiar elements according to known methods" that "does no more than yield predictable results." *KSR*, 550 U.S. at 416. Each feature performs the same function in the combined system that Fields describes it performing individually: the sensors detect, the location unit locates, the communication unit transmits, the server determines relevance, and the display and speaker alert. Ex. 1002, ¶113. Fields' overarching objective—to "facilitate safer vehicle travel" by alerting vehicles to abnormal conditions (Ex. 1004, 1:44–50)—is directly served by combining its complementary features into one system. Ex. 1002, ¶113.

A POSITA would have had a reasonable expectation of success in making this combination. *Id.,* ¶114. Fields has already done the integration work: it states that "features depicted in multiple Figures are designated with consistent reference numerals" (Ex. 1004, 3:36–39), explains which component of one figure implements which component of another (*see, e.g., id.* at 9:42–46, 12:60–13:2), and describes the communication links between them (*id.* at 10:27–11:11). Fields further teaches that the processing "may be performed locally, remotely, or any suitable

combination of local and remote processing techniques" (*id.* at 13:3–7), confirming that the vehicle-side and server-side features were designed to interoperate. The underlying technology—GPS location, accelerometer and airbag sensing, cellular and Wi-Fi communication, and server-side comparison of location data to thresholds—was mature and well understood, and Fields describes implementing it with conventional, commercially available hardware, operating systems, and communication protocols. *Id.,* 11:3–11, 14:4–18, 15:36–59; Ex. 1002, ¶114. Because the combination involves only arranging Fields' own compatible components in the manner Fields describes, a POSITA would have expected it to work predictably. Ex. 1002, ¶114; *see KSR*, 550 U.S. at 416–17.

Accordingly, to the extent Fields is found not to disclose the relied-upon features arranged in a single embodiment, combining those features in a single embodiment would have been obvious for the reasons discussed. Ex. 1002, ¶115.

[1.1] "a server in communication with a first microprocessor of a first vehicle, the first microprocessor operative to receive a first communication sent from the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle"

As explained below with respect to Figures 2 and 3, Fields discloses an external computing device 206/186 ("a server," **orange**) in communication with controller 340 and its microprocessor 306 (individually or jointly "a first microprocessor," **red**) of a computing device 300 (**pink**) in vehicle 202.1 ("a first

vehicle," **red**).

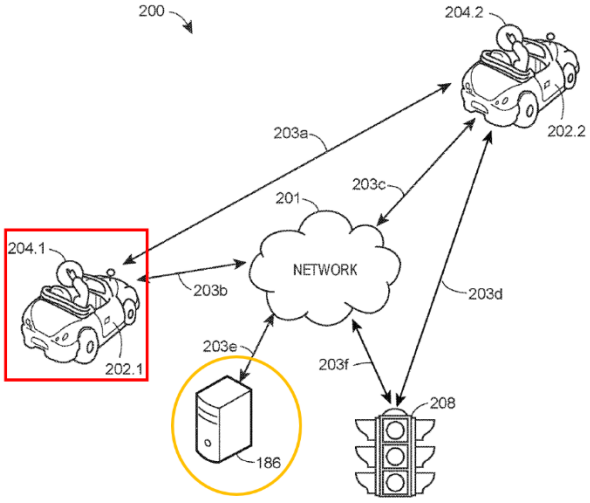


FIG. 2

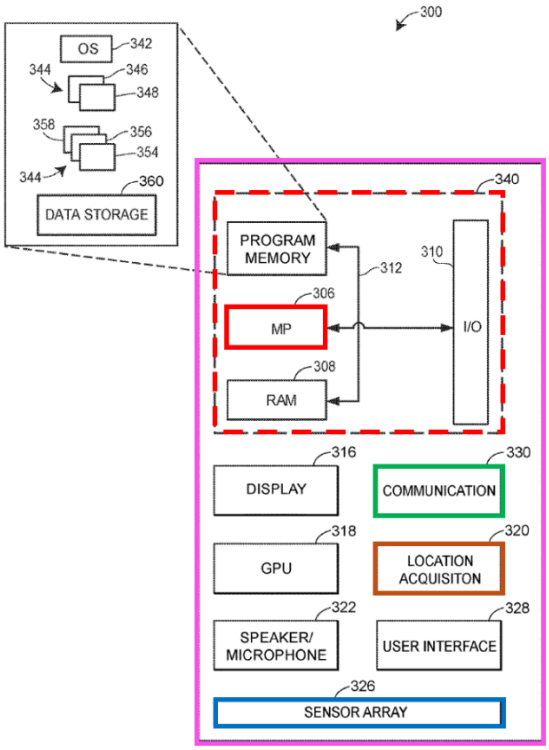


FIG. 3

With respect to the "server," Fields teaches that "external computing device 206 [**orange**] may be implemented as a network ***server***, a web-***server***, a database ***server***…." Ex. 1004, 11:40–44.

With respect to the "microprocessor," Fields teaches that "computing device" 300 (**pink**) may be incorporated into the on-board vehicle computer 114 (FIG. 1) of vehicle 202.1 or may be a mobile computing device 110 "permanently installed in vehicle." *Id.,* 7:56–9:2; 12:58–13:2. As Fields explains, the computing device 300 has a "***microprocessor*** (MP) 306" (**red**) that is part of "controller" 340 (**red**), which itself can "be implemented as ***any suitable type and/or number of processors***":

> In one aspect, controller 340 may include a program memory 302, **a *microprocessor (MP) 306*** [**red**], a random-access memory (RAM) 308, and/or an input/output (I/O) interface 310, each of which may be interconnected via an address/data bus 312. Controller 340 may be implemented ***as any suitable type and/or number of processors***....

Id., 13:31–44.

A POSITA would understand that a microprocessor refers broadly to a chip containing logical elements for performing calculations and carrying out stored instructions, among other functions. Ex. 1002, ¶117 (citing Ex. 1015). Moreover, the '938 Patent itself states that "the microprocessor 102 may be considered a microcontroller…." Ex. 1001, 5:39–40. Fields thus discloses "a first microprocessor," in the form of microprocessor 306 (**red**) and/or in the form of controller 340 (**red**) implemented as a microprocessor (i.e., a "suitable type" of processor to control the on-board vehicle system 114). Ex. 1002, ¶117.

The server 206 (**orange**) "is in communication with a first microprocessor [**red**] of a first vehicle." Specifically, Fields teaches:

> Program memory 302 may store data used in conjunction with one or more functions performed by computing device 300 ***to facilitate the interaction between computing device 300 and one or more other devices***. For example, if computing device 300 is implemented as a mobile computing device (e.g., mobile computing device 204.1, as shown in FIG. 2), then program memory 302 may store one or more programs, applications, algorithms, etc. that, ***when executed by***

> ***controller 340*** [red]***, facilitate the interaction between mobile computing device 204.1*** and (i) one or more networks (e.g., network 201), (ii) other mobile computing devices (e.g., mobile computing device 204.2), (iii) ***external computing devices (e.g., external computing device 206)***, (iv) vehicles (e.g., vehicle 108), (v) vehicle on-board computers (e.g., on-board computer 114), infrastructure components (e.g., smart infrastructure component 208), etc.

Ex. 1004, 13:45–60. A POSITA would understand that when controller 340 "facilitate[s] the interaction between" computing device 300 and "external computing devices (e.g., external computing device 206)," microprocessor 306 and controller 340 are both necessarily "in communication" with server 206. Ex. 1002, ¶118. This communication occurs via communication unit 330 (**green**), which is "configured to facilitate communications between computing device 300 and one or more other devices, such as … external computing devices." Ex. 1004, 14:32–36. As explained below, controller 340 and microprocessor 306 communicate with server 206 (using communication unit 330) to notify it of the vehicle's location and hazardous condition.

Fields discloses the claim requirement of "a first communication sent from the first vehicle [vehicle 202.1, **red**] to the server [external computing device 206, **orange**] indicating the first vehicle is in a hazardous condition and a location of the first vehicle." Specifically, Fields discloses detection of a hazardous condition by

the first vehicle when "the one or more sensor metrics indicate that an airbag has been deployed, and thus the vehicle associated with computing device 300 has been in an accident" (*id.* at 19:47–50) or when a "rollover" condition is detected (*id.* at 19:60–63). Fields further explains that it is the vehicle that detects the occurrence of an anomalous condition based upon the sensor data and transmits a notification to the server. *Id.,* 47:1–48:59 (discussing Figure 11). Fields also discloses that computing device 300 gathers "geographic location data" and "telematics data" via location acquisition unit 320 (e.g., using GPS) (**brown**). *Id.,* 15:36–59, 18:59–63. For example, Fields teaches that, upon determination of an anomalous condition:

> [T]he external computing device [server 206, **orange**] may determine, ***from telematics data and geographic location*** data received from a first computing device 300 [**pink**], that a first vehicle is located on a highway at a certain geographic location.

Id., 21:46–54. A POSITA would thus understand that Fields teaches that the first computing device 300 sends an indication of a hazardous condition of the first vehicle and the first vehicle's location to the server 206. Ex. 1002, ¶119. Indeed, Fields expressly teaches that "[t]his anomalous condition may also be ***correlated*** to the geographic location associated with the geographic location data due to synchronization between the geographic location data and the sampled telematics data." Ex. 1004, 20:10–13. The vehicle location and hazardous condition are correlated by the controller/processor when the vehicle itself experiences the

hazardous condition (e.g., an accident or airbag deployment). Ex. 1002, ¶119.

Fields also discloses that the "first microprocessor" (**red**) is "operative to receive" the "first communication sent from the first vehicle to the server" that indicates the vehicle location and hazardous condition. Specifically, Fields assigns to controller 340 the processing of the data provided by the sensor array 326 and location acquisition unit 320 prior to transmission to the server via communication unit 330. Ex. 1004, 15:14–21 ("Controller 340 … ***analyz[es] a memory address range (e.g., in data storage 360, RAM 308, etc.) associated with the storage of the telematics data***…."); *id.* at 18:55–19:3 (explaining that telematics collection routine 354 includes instructions that, "when executed ***by controller 340***, facilitate sampling, monitoring, measuring, ***collecting***, quantifying, ***storing***, encrypting, ***transmitting***, and/or broadcasting ***of telematics data***," including data collected "via sensor array 326, location acquisition unit 320, controller 340, etc."); *id.* at 19:6–12 (explaining that geographic location determination routine 356 includes instructions that, "when executed ***by controller 340***, facilitate sampling, measuring, ***collecting***, quantifying, ***storing***, ***transmitting***, and/or broadcasting of geographic location data (e.g., GPS data)"); *id.* at 19:21–28 (Anomalous condition detection routine 358, "when executed ***by controller 340***, facilitate[s] the determination of whether an anomalous condition exists ***based upon the telematics data, the geographic location data***"); *see also id.* at 48:23–41 (explaining that the mobile computing device 110

or on-board computer 114 "may generate an electronic message based upon the detected anomalous condition" and that the message "may include information regarding the ***type*** and ***location*** of the anomalous condition"); Ex. 1002, ¶120.

Fields thus teaches that controller 340 executes routines that both process sensor data (e.g., airbag deployment and/or rollover detection data) and GPS data and transmit that data to the server via the communication unit. Ex. 1002, ¶121. Controller 340 and microprocessor 306 are thus operative "to receive a first communication sent from the first vehicle to the server [e.g., from airbag deployment and/or rollover sensor 326 and location acquisition unit 320] indicating the first vehicle is in a hazardous condition and a location of the first vehicle." *Id*. Annotated Figure 3 below shows how the sensor communications are received by the controller 340 and microprocessor 306 before being sent to the communication unit 330 for transmission to the server. *Id.*

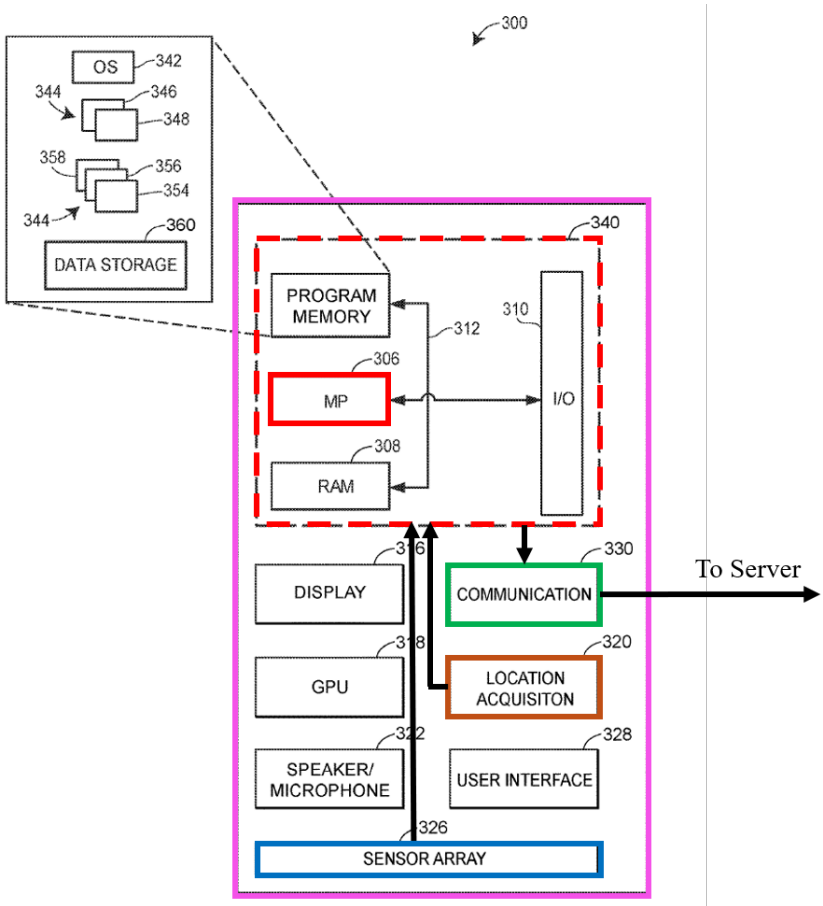


FIG. 3

Even absent these teachings, a POSITA would understand that because the microprocessor 306 is part of the controller 340, it coordinates all computer-related tasks for the vehicle alert system. *Id.,* ¶122. As such, microprocessor 306 and controller 340 would be understood to receive communications from the sensor array 326 and location acquisition unit 320 into memory (e.g., program memory, RAM, and/or cache or register of the microprocessor 306) and then process and analyze the communications before sending them to communication unit 330 for transmission to the server 206/186 via the network. *Id.* (providing background knowledge of a

POSITA evidenced by Ex. 1010, 15; Ex. 1011, 14). A POSITA would understand this to be how basic signaling and processing of sensor-based alerts and notifications occur. *Id.* (citing Ex. 1006, 6:40–44, 6:55–60 (explaining that a "crash detection system" in a vehicle detects a crash and provides notice to processing system 101, which then "cause[s] the wireless communication system 105 to transmit notice of the crash to a … remote location"); Ex. 1007, ¶[0039] (on-board microprocessor detects GPS-sensed movement and "then causes the relevant signal to be transmitted")).

This is consistent with the specification of the '938 Patent, which teaches that microprocessor 102 (corresponding to microprocessor 306 and/or controller 340 of Fields) "may have access to GPS data for use in providing data about the vehicle in which it is installed" via "GPS unit 125" (corresponding to location acquisition unit 320 of Fields) and may "receive an electronic signal from the vehicle that is indicative of a hazardous condition." Ex. 1001, 7:61–66, 2:16–25, Abstract. For example, airbag deployment is detected by microprocessor/microcontroller 110 (e.g., an "airbag controller or sensor") and relayed to microprocessor 102.[6] Ex. 1001, 6:45–55; 7:13–19. The microprocessor then sends the deployment signal to the

[6] Notably, in the co-pending litigation Patent Owner alleges that this limitation is necessarily taught based on vague marketing literature of Petitioner describing how alerts are broadcast over a network. Ex. 1008; Ex. 1009, 2.

server via a transmitter. *Id.,* 2:16–25 ("In response to receiving the signal indicative of a hazardous event, the microprocessor sends a first wireless signal via the first radio transmitter that indicates the vehicle is involved in the hazardous condition."); *See also id.*, 10:39-45, Abstract; Ex. 1002, ¶123.

A POSITA would also understand that the communication unit 330 is taught as being able to communicate with the server "via cellular communications" (Ex. 1004, 14:46–55), which means that the communication unit would have a cellular modem. Ex. 1002, ¶124. Before August 2019, a POSITA knew that cellular modems necessarily included, or were necessarily implemented as, a baseband processor, often with or alongside a digital signal processor (DSP). *Id.* (citing Ex. 1013, ¶[0026]; Ex. 1014, 10:14–19). A baseband processor is a dedicated chip in a wireless device that manages all cellular radio and network communication functions, including packaging of information before transmission over the network. *Id*. A DSP is a specialized microprocessor built to rapidly process digitized signals (*e.g.*, modulation, demodulation, filtering, and error coding) in real-time. *Id*. A POSITA would understand that in the cellular communication embodiments, each of the baseband processor and DSP of the communication unit 330 would be "microprocessors" that receive communications (via controller 340/microprocessor 306) from the sensors (e.g., airbag deployment sensor) and location acquisition unit before processing those communications for transmission to the server over the radio

airwaves. *Id*. Thus, in addition to controller 340/microprocessor 306, these microprocessors also satisfy the "microprocessor operative to receive" limitation. *Id*.

To the extent it is argued that this limitation is not met based on Fields alone, it would have been obvious to have the microprocessor receive the communications from the airbag deployment sensor and location acquisition unit as part of its telematics-collection duties so that those telematics could be analyzed and packaged together to be sent out by the communication unit. *Id.,* ¶125. It would have also been obvious for the communication unit to include a baseband processor with a DSP, to process the communication received from the microprocessor before sending it to the server. *Id.* (citing Ex. 1010, 12, 15; Ex. 1011, 12, 14; Ex. 1013, ¶[0026]; Ex. 1014, 10:14–19). As noted above, in ordinary microprocessor and transmitter architecture, sensor and location inputs are received by the processor before an outbound message is formed and transmitted by a communication unit and a cellular communication unit includes a baseband processor with a DSP. *Id.,* ¶¶122, 124–125 (discussing Ex. 1010, 12, 15; Ex. 1011, 6, 11, 14). A POSITA would have found it obvious based on the general knowledge to have the controller 340 and microprocessor 306 receive, process, and combine all telematics data prior to transmission to the communication unit, in accordance with standard computer architecture and design practices. This would have involved nothing more than applying a known technique to improve the system of Fields by ensuring that all

relevant telematics are combined and synchronized (e.g., hazard condition tied to location and time data), which would improve communication efficacy. *Id.*, ¶125.

[1.2] "wherein the server receives a second communication sent from a second vehicle to the server indicative of a location of the second vehicle"

As shown below, Fields teaches that the external computing device 206/186 ("the server," **orange**) receives a second communication sent from vehicle 202.2 ("a second vehicle," **blue**) to the server indicative of a location of the second vehicle. Ex. 1002, ¶126.

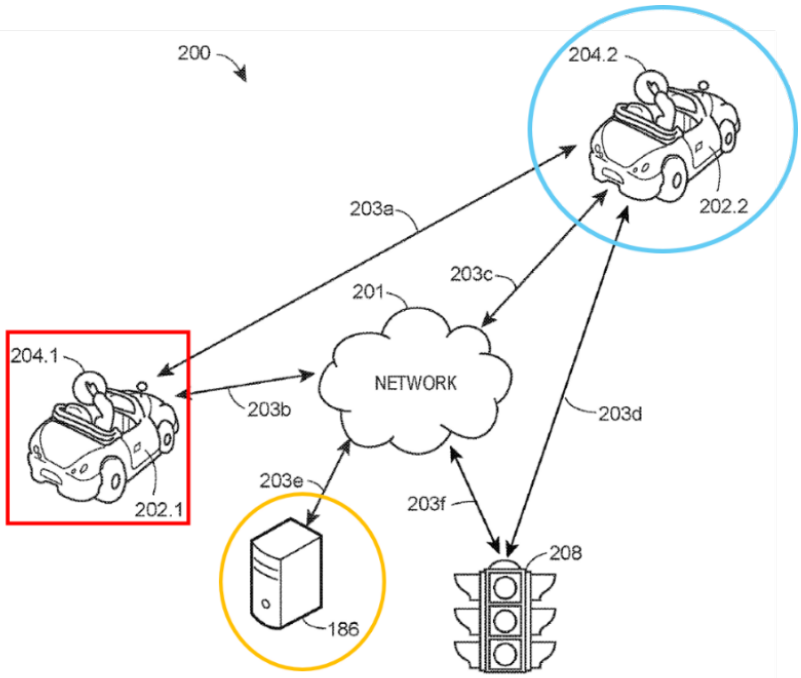


FIG. 2

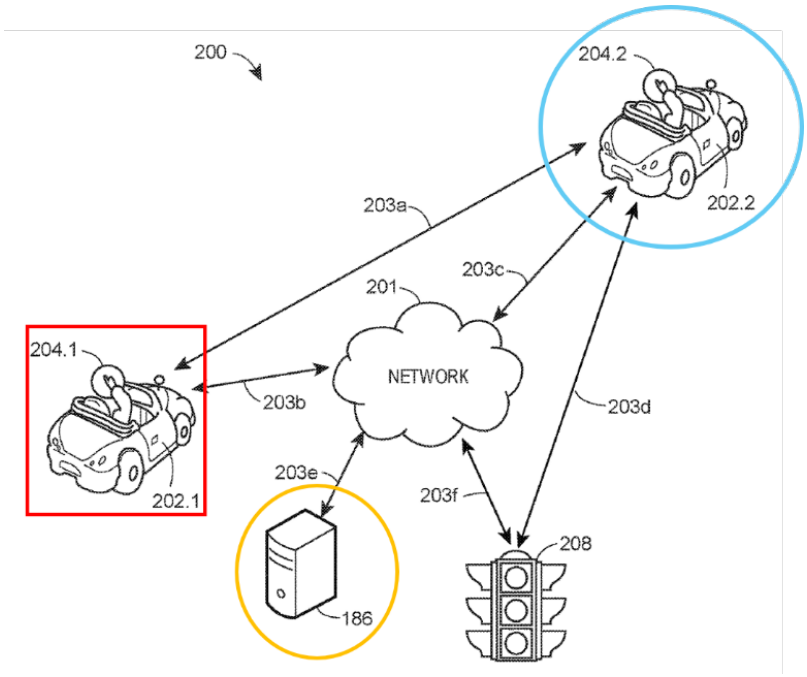
As with the first vehicle (vehicle 202.1, **red**), the second vehicle (vehicle 202.2, **blue**) has its own associated computing device 300. Ex. 1004, 9:46–49, 12:60-66. Each computing device 300 gathers location data for its vehicle (here, second

vehicle 202.2) from location acquisition unit 320. *Id.*, 10:40–52, 15:36–46. Fields specifically teaches that "the second computing device 300 associated with the second vehicle may likewise broadcast telematics data and geographic location data to the external computing device." *Id.*, 20:56–59.

Thus, Fields teaches that a server (external computing device 206) receives a second communication sent from a second vehicle (vehicle 202.2) to the server indicative of a location of the second vehicle. Ex. 1002, ¶¶126–27.

[1.3] "wherein the server provides a third communication to the second vehicle when it is determined that the locations of the first and second vehicle lie on a common roadway path and within a predetermined distance of one another."

Fields discloses that the external computing device 206/186 (**orange**) determines whether to transmit a hazard alert ("a third communication") to vehicle 202.2 ("the second vehicle," **blue**) based on (i) its proximity to vehicle 202.1 (i.e., "the first vehicle") and (ii) whether the vehicles are on the same highway ("a common roadway path").



More specifically, Fields teaches:

To provide additional examples, mobile computing devices 204.1 and 204.2 may be configured to communicate with one another via radio links 203b and 203c by each communicating with network 201 utilizing a cellular communication protocol. As an additional example, mobile computing devices 204.1 and/or 204.2 may be configured to communicate with external computing device 206 via radio links 203b, 203c, and/or 203e.

***

The external computing device [server 206/186, **orange**] may determine, from telematics data and geographic location data received from a first computing device 300, that a first vehicle [**red**] is located on a highway at a certain geographic location. **If the external computing device determines that a second computing device 300 in a vehicle [202.2, blue] travelling on the same highway is within a**

> **threshold distance approaching the first vehicle [202.1, red], then the external computing device [server 206/186, orange] may issue an alert notification to the second vehicle.**

Id., 10:27–34, 21:46–54. A POSITA would understand that second vehicle 202.2 "travelling on the same highway" as first vehicle 202.1 means that the vehicles are on a "common roadway path." Ex. 1002, ¶¶128–29. A POSITA would also understand that determining whether the vehicles are within "a threshold distance" of one another is the same as determining whether they are within a "predetermined distance" of one another. *Id.* ¶129. Indeed, the "threshold distance" on which Fields' alert system bases its decision whether to notify the second vehicle is necessarily a predetermined parameter. Ex. 1004, 21:24–35 (providing "a half mile" as an example "threshold distance").

Thus, Fields expressly teaches the requirements of this claim element.

2. Claim 2: "The system of claim 1, wherein the second vehicle is equipped with a second microprocessor in communication with the server that provides an alert to an occupant of the second vehicle upon receipt of the third communication."

Fields discloses that each vehicle 202, including "second vehicle" 202.2, may have its own computing device 300 (**pink**). Ex. 1004, 9:36–65, 12:60–66. As previously explained and shown below, computing device 300 includes microprocessor 306 and controller 340 (which may also be implemented as a microprocessor) (**red**), which are necessarily in communication with external

computing device 206/186 ("the server") to "facilitate the interaction between mobile computing device 204.1 and … external computing devices (e.g., external computing device 206)." Ex. 1004 at 13:45–60; *supra* Section VII.A.1.[1.0]–[1.1].

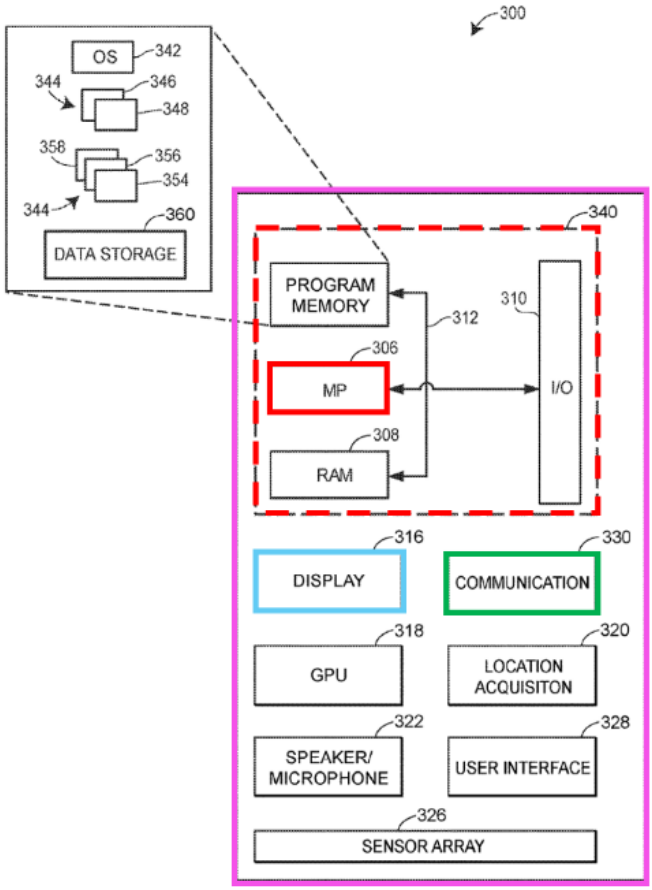


FIG. 3

Thus, Fields discloses that "the second vehicle [202.2] is equipped with a second microprocessor [MP 306/controller 340, **red**] in communication with the server [external computing device 206/186, **orange**]." Ex. 1002, ¶131.

Microprocessor 306/controller 340 ("second microprocessor," **red**) also "provides an alert to an occupant of the second vehicle upon receipt of the third

communication." Fields teaches real-time detection of hazardous conditions and vehicle-location information and real-time alerting of drivers of those conditions. Ex. 1004, 34:23–29; *see also id.* at 6:20–33, 19:40–43. "[T]he second computing device 300 may further process the telematics data and take the appropriate relevant action if an anomalous condition is found (e.g., ***issue an alert notification***, ***generate an alert***, ***display a warning message***, etc.)." *Id.*, 20:43–50. More specifically:

> When relevant, external computing device may be configured to ***send alert notifications*** to the first and/or second devices 300…. ***Upon receiving the notification*** from the external computing device, the first and/or second computing device 300 may ***generate an alert indicating a description of the anomalous condition and/or its location***.

Id., 20:63–21:6. Thus, MP 306/controller 340 ("microprocessor") of the second vehicle "provides an alert to an occupant of the second vehicle upon receipt of the third communication." Ex. 1002, ¶132.

3. Claim 3: "The system of claim 1, wherein the first microprocessor is in communication with a global positioning system associated with the first vehicle to determine the location of the first vehicle."

Fields discloses that MP 306/controller 340 ("the first microprocessor," **red**) is in communication with the location acquisition unit 320 ("a global positioning system," **green**) associated with the first vehicle (202.1) to determine the location of the first vehicle.

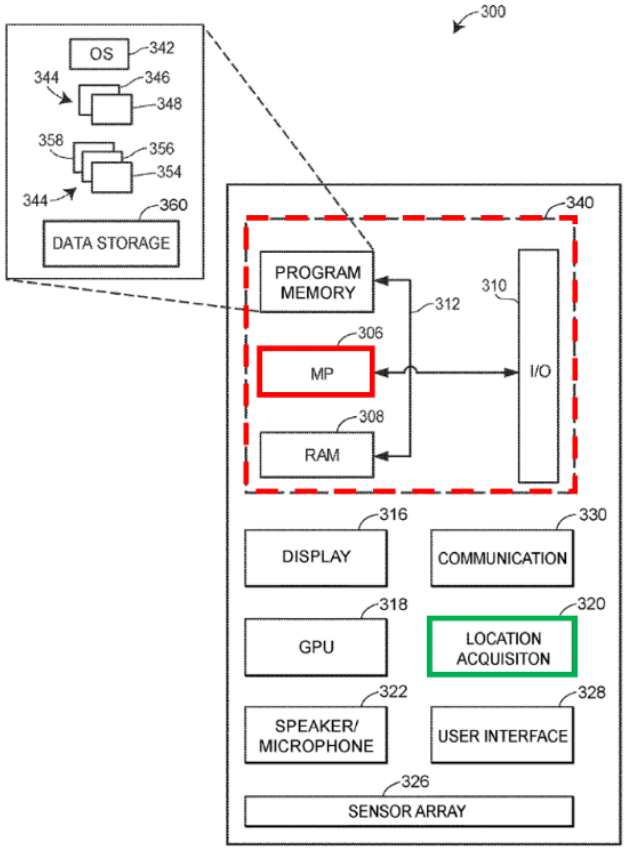


FIG. 3

Specifically, Fields teaches that "[c]omputing device 300 may include … a location acquisition unit 320" (**green**). *Id.*, 13:26–30. Fields further explains that "[l]ocation acquisition unit 320 may be configured to generate geographic location data utilizing any suitable global positioning techniques … to determine a location of computing device 300 … **[such as] 'Assisted Global Positioning System' (A-GPS), satellite GPS**, or any other suitable global positioning protocol … to determine a geographic location of computing device 300." *Id.*, 15:36–46.

Because computing device 300 (which includes MP 306/controller 340) is located within vehicle 202.1 ("the first vehicle"), Fields teaches that "the first

microprocessor is in communication with a global positioning system associated with the first vehicle to determine the location of the first vehicle." Ex. 1002, ¶¶133–34.

4. Claim 4: "The system of claim 1, wherein the alert to the occupant of the second vehicle is a visual indication."

This claim depends from claim 1 and refers to "***the*** alert to the occupant of the second vehicle." However, antecedent basis for that limitation is found only in dependent claim 2.

A POSITA would understand that the dependence on claim 1 is a latent error resulting from cancellation of the original claim from which issued claim 4 depended during prosecution. Specifically, issued claim 4 was then-pending claim 30 during prosecution, which depended on then-pending claim 29. Ex. 1003, 36, 665. However, then-pending claim 29 was cancelled and then-pending claim 30 was amended to refer back to then-pending claim 26 (issued independent claim 1), even though claim 26 provided no antecedent basis for "the alert." *Id.*, 380–82. This error remained latent during prosecution, resulting in claim 4's lack of proper dependency. A POSITA would understand, however, that the applicant intended for then-pending claim 30 to depend from then-pending claim 27, which ultimately issued as dependent claim 2. A POSITA would thus understand that claim 4's dependency on claim 1 was an obvious error and would instead understand claim 4 to depend on

claim 2. Ex. 1002, ¶¶135–36; *see Fitbit, Inc. v. Valencell, Inc.*, 964 F.3d 1112, 1119–20 (Fed. Cir. 2020) (holding that the Board erred in not correcting a "conspicuous" and undisputed error related to antecedent basis).

Fields discloses this limitation regardless of whether the antecedent-basis error is corrected. Fields teaches that computing devices 300 (**pink**) include a "display 316 [**blue**] [that] may be configured to work in conjunction with controller 340 [**red**] and/or GPU 318 to ***display alerts*** and/or notifications ***received from other devices*** indicative of detected anomalous conditions," and that these displayed alerts may be a "***visual warning*** to be presented on a screen." Ex. 1004, 14:28–31, 50:40–47; Ex. 1002, ¶137.

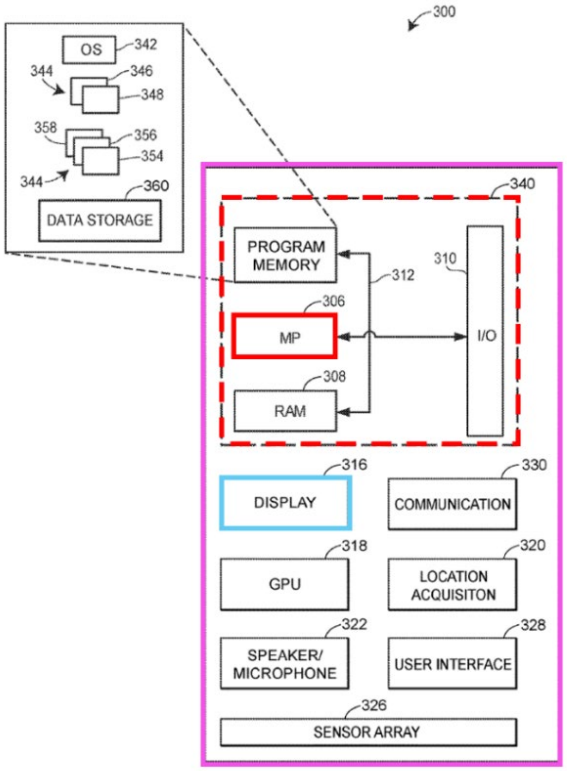


FIG. 3

Fields thus discloses that "the alert to the occupant of the second vehicle is a visual indication," regardless of its claim dependency. Ex. 1002, ¶138.

5. Claim 6: "The system of claim 1, wherein the alert to the occupant of the second vehicle is an audio alert."

As with claim 4, claim 6 also lacks antecedent basis in claim 1 for "***the*** alert." Claim 6 (then-pending claim 32) originally depended from then-pending claim 29, which was cancelled, resulting in the same latent error as claim 4. Ex. 1003, 36, 381–82, 665. A POSITA would thus understand that claim 6 was intended to depend from claim 2 (then-pending claim 27 (*id*. at 381)) and would interpret the claim that way. Ex. 1002, ¶139.

Fields discloses this limitation regardless of whether the antecedent-basis error is corrected. Specifically, Fields teaches that each computing device 300 (**pink**) has a "speaker/microphone 322 [**blue**] … [that] include[s] a speaker ***configured to play sound in response to data received from one or more components of computing device 300***." Ex. 1004, 15:64–67.

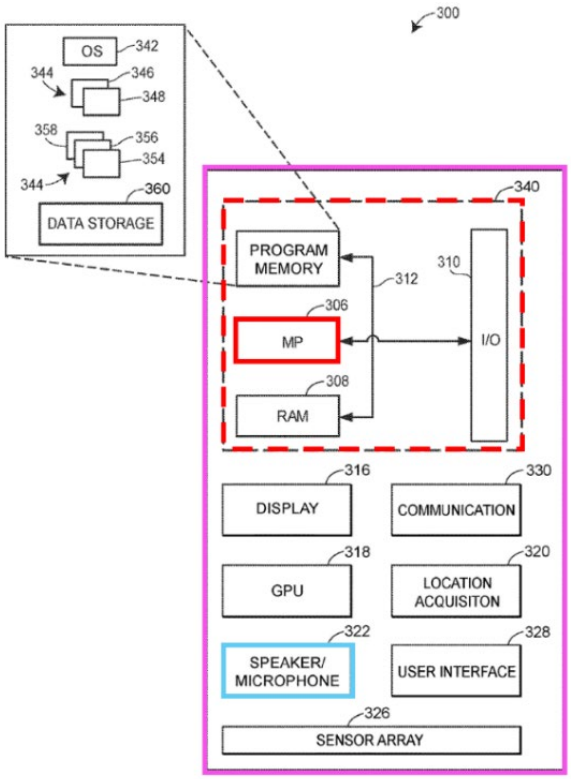


FIG. 3

More specifically, Fields teaches that speaker/microphone 322 "may be configured to play ***audible alerts***" in response to the receipt of an electronic message "from an external computing device" (i.e., the third communication). *Id.*, 16:1–2, 49:29–36. Fields further teaches that the alert may include "an ***audible warning*** to be presented by a speaker, or other types of warnings to [alert] the driver of the anomalous condition." *Id.*, 50:43–47.

Fields thus discloses that "the alert to the occupant of the second vehicle is an audio alert." Ex. 1002, ¶¶140–41. As with claim 4, the prior art meets the recited limitation whether the dependency is read as written or corrected to depend from claim 2. *See supra* Section V.D n.2.

B. Ground 2: Fields and Pisz Render Obvious Claims 1–4 and 6.

Fields anticipates or renders obvious claims 1–4 and 6 as explained above. *Supra* Section VII.A. To the extent Patent Owner argues that Fields does not expressly disclose or render obvious "***the first microprocessor operative to receive a first communication sent from the first vehicle to the server*** indicating the first vehicle is in a hazardous condition and a location of the first vehicle" (element [1.1]), that limitation would have been rendered obvious by Fields in view of Pisz. The remaining limitations of claims 1–4 and 6 are disclosed by Fields alone (as mapped in Section VII.A), are incorporated by reference in Ground 2, and are not affected by the Pisz modification. Ex. 1002, ¶142 n.6.

As explained with respect to element [1.1], Fields discloses, in reference to Figures 2 and 3 below, an external computing device 206/186 ("a server," **orange**) in communication with a controller 340 and microprocessor 306 (individually or collectively "a first microprocessor," **red**) of a computing device 300 (**pink**) in vehicle 202.1 ("a first vehicle," **red**). *Id.,* ¶143.

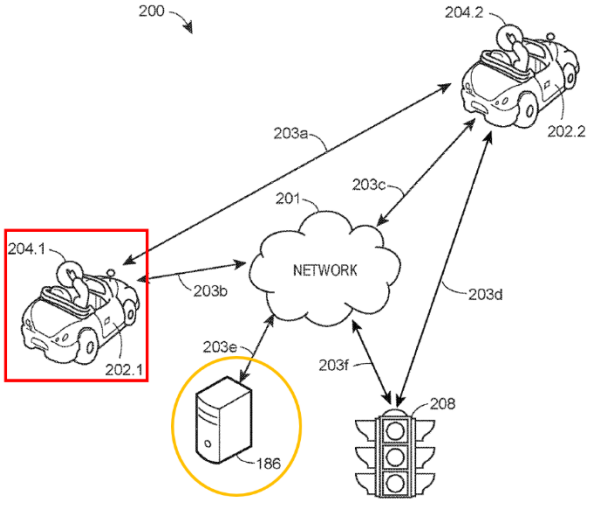


FIG. 2

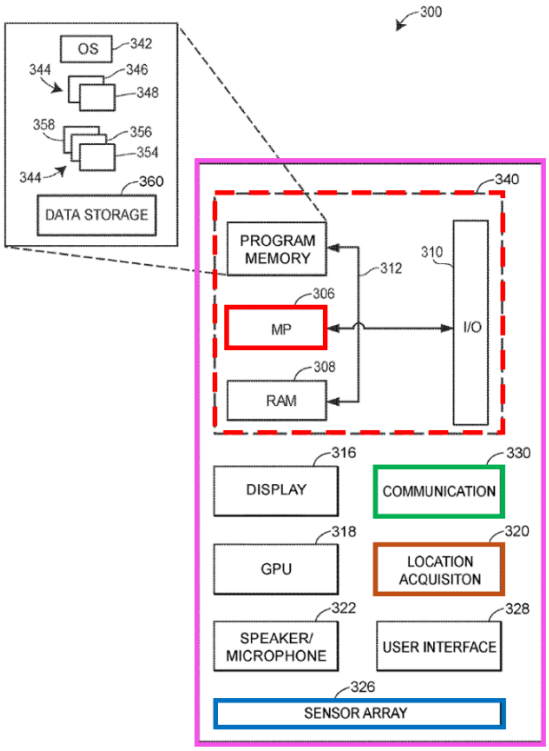


FIG. 3

Computing device 300 includes sensor array 326 (**blue**) for receiving telematics data, including airbag-deployment and rollover signals; location acquisition unit 320 (**brown**) for tracking the vehicle's location; and communication unit 330 (**green**) for transmitting signals to, and receiving signals from, server 206/186. *See supra* Section VII.A.1.[1.1].

Pisz is directed to a system in which a vehicle detects a crash condition and automatically provides a crash notification over a wireless network. *See* Ex. 1006, Abstract. Pisz discloses a computing device with components analogous to computing device 300 of Fields, including processing system 101 (**red**), which "may have only a single ***processor***" (*id.* at 6:8–10); location detection system 111

(**brown**), "configured to detect and communicate the location of the vehicle" (*id.* at 5:25–30); crash detection system 103 (**blue**), which "may detect a crash" (*id.* at 6:40–49); and wireless communication system 105 (**green**), which at the direction of processing system 101, "may transmit notice of the crash to a call center at a remote location" (*id.* at 6:55–58). Ex. 1002, ¶144.

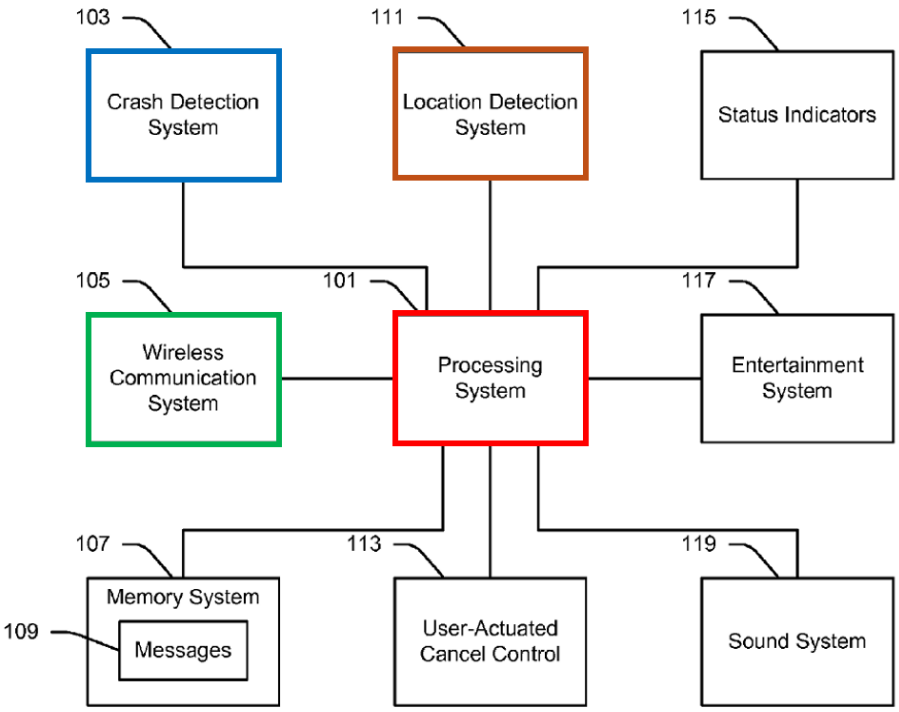


Fig. 1

Pisz teaches that "crash detection system 103 may detect a crash," that processing system 101 may "receive notice of this communication from the crash detection system 103," and that processing system 101 may then "cause the wireless communication system 105 to transmit notice of the crash to a call center at a remote

location." Ex. 1006, 6:40–44, 6:55–58. "The transmitted information may include information about the location of the vehicle at the time of the crash," obtained "from the location detection system 111." *Id.*, 7:11–16. Thus, Pisz teaches that a crash alert from crash detection system 103 and GPS information from location detection system 111 are provided to processor 101, which then provides that information to wireless communication system 105 for transmission to a remote location. Ex. 1002, ¶144.

As explained below, Pisz would have made it obvious to configure Fields' controller 340 and/or microprocessor 306 to receive hazardous-condition alerts from sensor array 326 and location information from location acquisition unit 320 and then provide that information to communication unit 330. *Id.,* ¶145.

1. Fields and Pisz Are Analogous Art.

Fields and Pisz are within the same field of endeavor as the claimed invention. The field of endeavor of the '938 Patent is vehicle-to-vehicle and vehicle-to-infrastructure communication systems for detecting and communicating hazardous vehicle and road conditions to enhance driver safety. *Id.,* ¶92. The '938 Patent's Abstract describes "[a] system for signaling a hazard condition of a vehicle [that] includes a microprocessor configured to receive an electronic signal from the vehicle that is indicative of a hazardous condition" that, "[i]n response to receiving the signal indicative of a hazardous event … sends a first wireless signal … that indicates the

vehicle is involved in the hazardous condition." Ex. 1001, Abstract. Independent claim 1 recites a system for providing "real time indication of a hazardous vehicle condition" using a server that receives hazard and location information from a first vehicle and provides hazard alerts to a second vehicle when the vehicles "lie on a common roadway path and within a predetermined distance of one another." *Id.*, 14:51–65.

Similarly, Fields expressly relates to a system for "generating and collecting data at a connected vehicle, and using the data and/or vehicle-to-other device … wireless communication (e.g., vehicle-to-vehicle or vehicle-to-infrastructure) and data transmission to facilitate safer vehicle travel …." Ex. 1004, 1:44–50. Like the '938 Patent, Fields teaches a first vehicle that detects a hazardous condition (such as an airbag deployment indicating an accident or a rollover event), gathers vehicle-location data via GPS, and transmits that information wirelessly to an external computing device (server). *Id.*, 19:47–50, 19:55–63, 15:36–59, 14:32–36, 13:45–60. The server then determines whether to transmit hazard alerts to second vehicles based on whether the second vehicle is "within a threshold distance approaching the first vehicle" and "travelling on the same highway." *Id.*, 21:46–54. Thus, Fields is in the same field of endeavor as the claimed invention and seeks to address the same problems as the '938 Patent, such as the most effective way to alert drivers of dangerous conditions. Ex. 1002, ¶93.

Pisz is likewise in the same field and addresses the same problems. Pisz is an "automatic crash notification system" designed to "detect a crash of a vehicle" and "wirelessly transmit a message to and wirelessly receive a message from a remote location," including a "notice of a crash." Ex. 1006, Abstract. Like the '938 Patent, Pisz detects a hazardous condition (e.g., a vehicle crash) and conveys that information to a remote location. *Id.* Thus, Pisz is in the same field of endeavor as the claimed invention and addresses the same problems as the '938 Patent, such as the most effective way to alert drivers of dangerous conditions. Ex. 1002, ¶94.

2. The Combination Was Obvious

To the extent Fields is not found to disclose a "microprocessor" that "receive[s] a first communication sent from the first vehicle," a POSITA would have been motivated—based on Pisz—to configure Fields' controller 340 and/or microprocessor 306 so that location information generated by location acquisition unit 320 and hazardous-condition information—including airbag-deployment information generated by sensor array 326—are received and processed by controller 340/microprocessor 306, combined into a hazard message, and then provided to communication unit 330 for transmission to the server. Three independent rationales support that conclusion, and a POSITA would have had a reasonable expectation of success. *Id.,* ¶146.

First, Fields places controller 340/microprocessor 306, location acquisition

unit 320, sensor array 326, memory, and communication unit 330 within the same computing device 300, with those components interconnected for data handling. Ex. 1004, 13:26–60. Its telematics collection routine 354, when executed ***by controller 340***, collects, stores, encrypts, transmits, and broadcasts telematics data obtained through sensor array 326 and location acquisition unit 320; its location routine similarly processes GPS data; and its anomaly-detection routine evaluates telematics and geographic-location data together. *Id.*, 18:54–19:43. Fields also assigns controller 340 the decision whether sampled data should be transmitted by communication unit 330. *Id.*, 14:56–15:21. Those express teachings would have led a POSITA to route the GPS and airbag-deployment notifications through controller 340/microprocessor 306 so that they could be analyzed and correlated with one another before transmission just as taught by Pisz. Ex. 1002, ¶147.

Second, Pisz addresses how an in-vehicle system should convert crash-sensor and location inputs into a remotely transmitted notification. Its processing system 101 receives notice from crash detection system 103, whose sensors may detect airbag deployment; obtains GPS location from location detection system 111; and causes wireless communication system 105 to transmit a crash notice containing the crash type, location, severity, time, and airbag-deployment information to a remote call center. Ex. 1006, 4:3–33, 5:25–29, 6:40–7:27. A POSITA implementing Fields' materially similar sensor-processor-transceiver architecture would have had an

apparent reason to adopt Pisz's express routing solution to convey communications to a remote location. Ex. 1002, ¶148.

Third, Fields' sensor array 326, location acquisition unit 320, controller 340/microprocessor 306, and communication unit 330 correspond directly to Pisz's crash detection system 103, GPS-equipped location detection system 111, processing system 101, and wireless communication system 105. Each component would continue performing its ordinary function: the sensor reports airbag deployment, the GPS unit supplies location, the processor forms and controls the message, and the communication unit transmits it. Pisz demonstrates that this sequence successfully delivers a combined crash-and-location notice to a remote recipient. Applying that same sequence to Fields would predictably deliver Fields' combined hazard-and-location message to its server. *Id*., ¶149.

Finally, a POSITA would have had a reasonable expectation of success in making the proposed modifications. Fields already discloses all required hardware and software functions, including a programmable controller, stored routines, sensor and GPS inputs, message preparation, and network communication with a remote server. Ex. 1004, 4:64–5:25, 11:36–62, 13:26–60, 14:32–15:21, 18:54–19:28. And Pisz confirms that its routing may be implemented by a general-purpose computer within a vehicle network. Ex. 1006, 6:6–8, 6:17–22. The modification therefore requires only ordinary programming and established interfaces, not new hardware

or a change in Fields' operating principle. Ex. 1002, ¶150.

C. Ground 3: Fields (With or Without Pisz) and Ricci Render Claim 5 Obvious.

Claim 5 recites: "The system of claim 4 wherein the visual indication is provided on a heads-up display." As discussed with respect to claim 4, Fields expressly teaches providing a "visual indication" of a hazardous condition on a "display." *Supra* Section VII.A.4. Fields does not expressly disclose that the display is a "heads-up" display, which is a display that projects information directly in a user's line of vision, such as a windshield with a transparent display. Ex. 1002, ¶151 (citing Ex. 1012). However, Ricci discloses that alerts, such as an alert about the presence of an emergency vehicle, may be provided to nearby vehicles in a "heads-up display" of those vehicles. Ex. 1005, 10:58–11:13, 93:23–43, 96:57–58 (claim 6), 97:24–25 (claim 12). Thus, Ricci teaches a "heads-up" display for alerting drivers. As explained below, a POSITA would have found it obvious to modify Fields (with or without the modifications based on Pisz) to provide visual indications of hazardous conditions on a heads-up display based on Ricci's teachings. Ex. 1002, ¶152.

1. Fields and Ricci Are Analogous Art.

Fields is analogous art to the '938 Patent, which is directed to vehicle-to-vehicle and vehicle-to-infrastructure communication systems for detecting and communicating hazardous vehicle and road conditions to enhance driver safety.

Supra Section VII.B.1.

Ricci is likewise analogous. Ricci is entitled "Radar Sensing and Emergency Response Vehicle Detection." Ex. 1005, 1. Ricci expressly describes "[a] system for communication of safety information comprising: a sensor adapted to detect at least one road hazard; a safety module adapted to categorize the at least one road hazard; a navigation subsystem adapted to associate a GPS coordinate with the road hazard; and a message module adapted to forward information about the road hazard to one or more entities." Ex. 1005, 8:20–28. Ricci further teaches that "the information is communicated directly to one or more other drivers based on the one or more other driver's proximity to the road hazard" and that such hazard information "is pushed automatically to one or more other vehicles and displayed on the one or more other vehicle's displays." *Id.*, 8:38–40, 8:51–53. A POSITA would readily understand that Ricci, like the '938 Patent and Fields, is directed to networked vehicle communication systems that detect hazardous conditions and wirelessly communicate those hazards to nearby drivers. Ex. 1002, ¶95. Thus, Ricci is in the same field of endeavor as the claimed invention and seeks to address the same problems as the '938 Patent, such as the most effective way to alert drivers of dangerous conditions. *Id*.

2. The Combination Was Obvious

An obviousness analysis "need not seek out precise teachings directed to the

specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418. Here, a POSITA would have been motivated to modify Fields to display hazard alerts on a heads-up display, as taught by Ricci, for at least three reasons. Ex. 1002, ¶153.

First, both Fields and Ricci are directed to communicating safety-critical information to vehicle drivers. Fields teaches a system for alerting drivers to "abnormal traffic conditions," including accidents and hazardous events. Ex. 1004, Abstract. Ricci likewise describes systems that "notify other drivers of dangerous situations" and provide "danger warnings between cars." Ex. 1005 at 79:66–80:2, 80:17–22, 82:65–83:14. A POSITA seeking to improve the driver's awareness of alerts in Fields' alert system would naturally look to Ricci's teachings on how to present safety alerts to drivers. Ex. 1002, ¶154.

Fields discloses that its in-vehicle systems incorporate displays and that alerts may be presented through various display mechanisms, including displays associated with a mobile computing device or the vehicle's on-board systems. Ex. 1004, 13:26–30, FIG. 3; *id.* at 9:16–21, 50:40–45 ("the mobile computing device 110 or on-board computer 114 may cause the determined alert or recommendation to be presented to the driver of the vehicle 202. This may include causing a visual warning to be presented on a screen associated with the mobile computing device

110 or on-board computer 114"). Notably, Fields does not limit the system to any particular display type: "Display 316 may be implemented as ***any suitable type of display*** … . For example, display 316 may be implemented as a capacitive touch screen display, a resistive touch screen display, ***etc.***" *Id.*, 14:23–27. This open-ended language invites a POSITA to consider all known display types—including heads-up displays—for presenting Fields' hazard alerts. Ex. 1002, ¶155. Using a heads-up display would have been an obvious design choice based on the limited number of display types available for vehicles at the time and the well-known suitability of such displays for providing important alerts to drivers focused on the road. *Id*.

Second, Ricci expressly teaches that a heads-up display is an appropriate mechanism for conveying safety-critical alerts. Ricci discloses a "vehicle alert system" with an "alert module adapted to detect a presence of an emergency vehicle" that displays the alert "in a heads-up display of the vehicle." Ex. 1005, 10:58–11:13; *see also id.* at 96:57–58 (claim 6). A POSITA would have understood the reason Ricci provides these alerts in a heads-up display: the driver is watching the road during normal, safe operation of the vehicle and thus is expected to be looking in the direction of the heads-up display. Ex. 1002, ¶156. Accordingly, a POSITA would have recognized that heads-up displays are particularly well suited for conveying urgent, safety-critical information—such as the hazard alerts disclosed in Fields. *Id.*

Third, by 2019, on-board vehicle computer systems commonly included

multiple displays: a central console display for noncritical functions (e.g., radio or navigation), a display behind the steering wheel for conveying vehicle-status information (e.g., mileage, speed, engine alerts), and a heads-up display for conveying important safety information to the driver, such as vehicle speed and potential-impact alerts (e.g., based on sensor data). *Id.,* ¶157 (citing Ex. 1018; Ex. 1005, 8:51–53, 10:58–11:12). A POSITA would have understood that many critical alerts—including hazard alerts like those disclosed in Fields—are best conveyed in the heads-up display because that is the direction the driver is expected to be looking during normal operation. *Id.* Modifying Fields to display its hazard alerts on a heads-up display, as taught by Ricci, would improve safety by ensuring that hazard alerts are presented directly in the driver's line of sight rather than requiring the driver to divert attention to an infotainment display or mobile device. *Id.*

A POSITA would have had a reasonable expectation of success in implementing a heads-up display for hazard notifications in Fields based on Ricci. Heads-up displays were well known and commercially available in vehicles by 2019, and implementing one for hazard alerts would have required nothing more than applying a known technique (displaying alerts on a heads-up display, as taught by Ricci) to a known device (the vehicle alert system of Fields) to yield predictable results (hazard alerts displayed in the driver's line of sight). *KSR*, 550 U.S. at 417; Ex. 1002, ¶158 (citing Ex. 1018). Specifically, a POSITA would have understood

that display 316 of Fields' computing device 300 could be implemented as a heads-up display, as taught by Ricci, so that hazard alerts are presented more directly, conveniently, and safely to the driver. *Id*.

In short, the combination of Fields and Ricci renders claim 5 obvious. Fields teaches every limitation of claims 1, 2, and 4 (from which claim 5 depends), including providing a visual indication of a hazardous condition on a display. *Supra* Sections VII.A.1–4. Ricci teaches providing safety-critical alerts on a heads-up display. Ex. 1005, 10:58–11:12, 96:57–58 (claim 6). A POSITA would have been motivated to combine these references to display Fields' hazard alerts on a heads-up display, as taught by Ricci, with a reasonable expectation of success. Ex. 1002, ¶159. Accordingly, claim 5 would have been obvious.

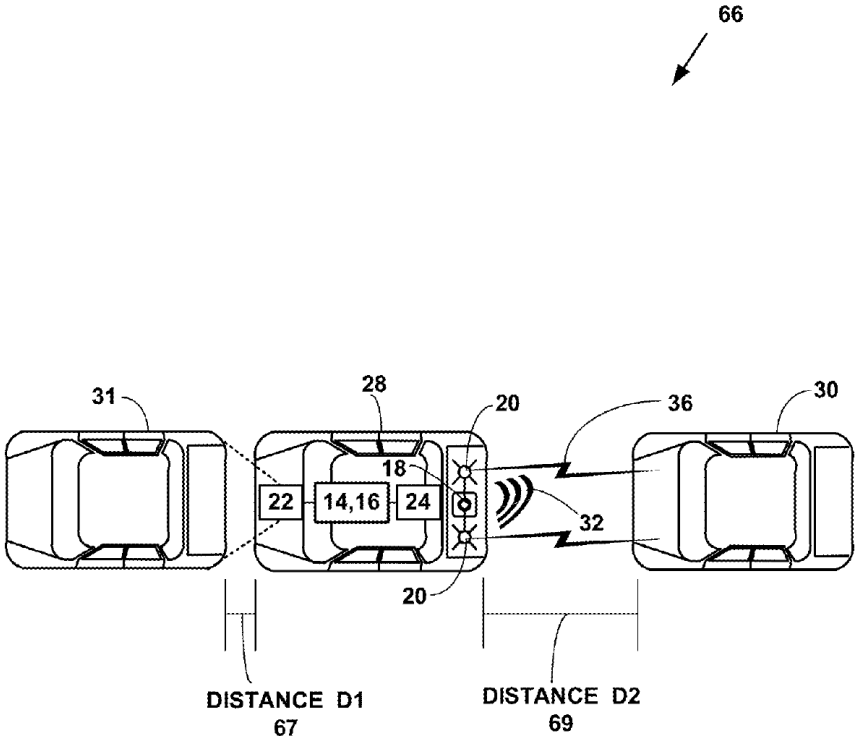
D. Ground 4: Fields (With or Without Pisz) and Seifert Render Claims 7 and 8 Obvious.

Like claims 4 and 6, claim 7 lacks antecedent basis in claim 1 for "***the*** alert" and was intended to depend from claim 2. Ex. 1003, 36, 381–82, 665. A POSITA would thus understand that claim 7 (then-pending claim 33) was intended to depend from claim 2 (then-pending claim 27 (*id*. at 381)) and would interpret the claim that way. *Supra* Section VII.A.4; Ex. 1002, ¶168. The prior art satisfies claim 7 whether the dependency is read as written or corrected to depend from claim 2.

Fields teaches every limitation of claims 1 and 2, including second vehicle

202.2, whose computing device 300 alerts its occupant upon receipt of the server's alert notification (the "third communication"). *Supra* Sections VII.A.1–2. Fields does not expressly disclose a "high conspicuity external visual indicator" activated when the alert is provided, or one that strobes the lights at the rear of the second vehicle. However, Seifert teaches automatically activating a rear-mounted strobe light 18 (*see* FIG. 10 below), visible to the vehicle directly behind, when the vehicle slows, comes within a certain distance of a vehicle ahead, or stops due to an emergency event such as an accident, in order to prevent rear-end collisions. Ex. 1016, ¶¶[0108], [0112], [0156], claim 1; Ex. 1002, ¶161.

FIG. 10



As explained below, it would have been obvious to modify Fields (with or

without Pisz) to equip the second vehicle with Seifert's rear strobe and activate it when the alert is provided. Ex. 1002, ¶161. All other limitations of claims 7 and 8 are disclosed by Fields alone (Ground 1) and by Fields with Pisz (Ground 2), as mapped in Section VII.A–B, are incorporated into this ground by reference, and are not affected by the Seifert modification. *Id.,* ¶162.

1. Fields and Seifert Are Analogous Art

Fields and Seifert are within the same field of endeavor as the claimed invention—vehicle safety systems that detect and communicate hazardous conditions to drivers. *Supra* Sections VI.D.2, VII.B.1; Ex. 1002, ¶96. Moreover, the '938 Patent is specifically concerned with "high conspicuity visual indicators," such as rear signal lights that "may be strobing at a high rate" (Ex. 1001, 8:64–9:1), and indicators differentiable from ordinary lights "based on a variable or increased flash rate, a variable or increased contrast, a variable or increased brightness, an altered or variable color, and/or a combination of these" (*id.*, 5:10–17). Ex. 1002, ¶97.

Seifert likewise "relates to preventing vehicle accidents" by warning drivers of dangerous roadway conditions, noting that roughly one-third of highway accidents are rear-end crashes. Ex. 1016, ¶¶[0002], [0004]. A POSITA would readily understand that Seifert, like the '938 Patent and Fields, is directed to detecting hazardous roadway conditions and warning nearby drivers of them. Ex. 1002, ¶98. Seifert is also reasonably pertinent to the problem addressed by claims 7 and 8—

making a vehicle conspicuous to other drivers when a hazard is present—because it teaches a rear-mounted strobe for that very purpose. Ex. 1016, ¶¶[0112]–[0113], [0127]. Thus, Seifert is analogous art. Ex. 1002, ¶98.

2. The Combination Was Obvious

A POSITA would have been motivated, for at least three reasons, to add Seifert's rear strobe to Fields' second vehicle 202.2 and automatically activate it when computing device 300 provides the hazard alert. *Id.,* ¶163.

First, Seifert addresses a danger created by Fields' own alert. Fields alerts the second vehicle's driver so ***that driver*** can avoid a condition ahead. Ex. 1004, 1:44–50, 6:14–33, 20:63–21:6. Seifert teaches that a driver so alerted will typically slow or stop to avoid hazardous conditions (e.g., when following vehicles risk a rear-end collision, particularly with distracted drivers). Ex. 1016, ¶¶[0004], [0114]–[0119]. A POSITA would have thus been motivated to increase the safety of Fields' "second vehicle" and the vehicles following it by automatically activating a rear strobe as taught by Seifert to help prevent a rear-end collision between them using the hazard alerts provided by Fields' server. This would have been understood to especially improve safety for following vehicles that are not part of Fields' server-alert network by visually alerting them. Ex. 1002, ¶164.

Second, Seifert activates its strobe in response to the same event Fields' alert represents: a hazard ahead. Seifert's front end monitor 22 turns on the strobe when

the vehicle "comes within a certain distance of any vehicle in front of it," and Seifert also activates it upon an "emergency event (e.g., accident…)." Ex. 1016, ¶¶[0104], [0106], [0108], [0156]–[0157]. Fields' server alert likewise provides early, distance-based notice of the hazard ahead. Ex. 1004, 21:46–54. Using that alert as an input to trigger a rear-strobe (e.g., via Seifert's signal detection circuit 14 implemented in Fields), which may receive wired signals from the vehicle's control system or wireless network signals (Ex. 1016, ¶¶[0041], [0043], [0067], claim 3), is the predictable use of a known technique to improve a similar system in the same way. *KSR*, 550 U.S. at 417; Ex. 1002, ¶165. It was already known to activate a rear strobe automatically "[i]n the event that a car[']s airbag deploys … to warn other drivers" and to initiate flashing lights in response to a hazard warning signal relayed vehicle-to-vehicle. Ex. 1002, ¶165 (quoting Ex. 1016, ¶[0016]; citing Ex. 1017, ¶¶[0039]–[0040]). Moreover, a POSITA would have understood that relying on Fields' server-based hazard alerts would have allowed the second vehicle to turn the strobe lights on sooner based on hazards that cannot be detected by Seifert's proximity sensor (e.g., a vehicle accident around a corner). *Id*.

Third, Seifert teaches that drivers "acclimatize" to brake lamps, whereas a strobe "helps re-focus a driver[']s attention" and "remain[s] visible in low visibility and bad weather." Ex. 1016, ¶¶[0009], [0113], [0120], [0138]. A strobe is thus well suited to warning following drivers of a hazard they may not yet see and preventing

rear-end collisions. Ex. 1002, ¶166.

A POSITA would have had a reasonable expectation of success. Fields' controller 340 already interacts with the vehicle's on-board computer 114 and generates alerts upon receipt of the hazard notification from the server, and Seifert's apparatus interfaces with "a control system in a vehicle" and can be "easily retrofitted." Ex. 1004, 13:45–60, 20:63–21:6; Ex. 1016, ¶¶[0041], [0178]. Each component performs its known function, yielding predictable results: Fields' alert is received and presented as before, and Seifert's strobe flashes rearward as Seifert describes. *KSR*, 550 U.S. at 416; Ex. 1002, ¶167.

a. Claim 7: "The system of claim 1, wherein the second vehicle is equipped with a high conspicuity external visual indicator that is activated when the alert is provided."

Fields discloses "the second vehicle" and "the alert." *Supra* Sections VII.A.2, VII.A.4–5. Seifert's very bright, directional strobe 18, installed in a rear portion of the vehicle and visible to the vehicle directly behind (Ex. 1016, ¶[0112], claim 1), is a "high conspicuity external visual indicator" consistent with the '938 Patent's description of that term. *Id.,* ¶¶[0113], [0128], [0173]; Ex. 1001, 5:10–17. It is distinguishable from ordinary brake and tail lights, which are generally not permitted to flash. Ex. 1016, ¶[0132]; Ex. 1002, ¶169.

In Figure 10, vehicle 28's front end monitor 22 detects that it has come within distance D1 of the vehicle ahead, and vehicle 28 activates its rear warning lights 18,

20 (strobe flash 32), visible to following vehicle 30. Ex. 1016, ¶¶[0156]–[0159], [0177], FIG. 10. Vehicle 28 is thus the claimed "second vehicle" (Fields' vehicle 202.2) and the vehicle ahead corresponds to the "first vehicle" (Fields' vehicle 202.1). Ex. 1002, ¶170. It is irrelevant that Seifert calls following vehicle 30 the "second vehicle" (Ex. 1016, ¶¶[0111], [0177]), because Seifert simply numbers vehicles from the perspective of the equipped vehicle, which it calls "first vehicle 28." *Id.,* ¶[0111].

In the combination, microprocessor 306/controller 340 of second vehicle 202.2, upon receipt of the third communication, both alerts the occupant and triggers Seifert's strobe, which is therefore "activated when the alert is provided." Ex. 1004, 20:63–21:6; Ex. 1016, ¶¶[0041], [0106]; *supra* Section VII.D.2. Accordingly, Fields (with or without Pisz) in view of Seifert renders claim 7 obvious. Ex. 1002, ¶171.

b. Claim 8: "The system of claim 7, wherein the high conspicuity external visual indicator is activated to strobe the lights at the rear of the second vehicle."

Seifert's strobe is "installed in a rear portion of the vehicle," directed to the vehicle "directly behind," and may be integrated into the CHMSL or the "third break [*sic*] light, left or right break [*sic*] lights." Ex. 1016, ¶¶[0112], [0139], claim 1. In Figure 10, vehicle 28's rear lights strobe toward following vehicle 30. *Id.,* ¶[0177], FIG. 10. The combination thus strobes "the lights at the rear of the second vehicle" (Fields' vehicle 202.2) and would have been obvious for the reasons above. *Supra*

Section VII.D.2; Ex. 1002, ¶172. Accordingly, Fields (with or without Pisz) in view of Seifert renders claim 8 obvious.

VIII. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that trial be instituted and that claims 1–8 of the '938 Patent be found unpatentable.

Respectfully submitted,

Dated: October 19, 2026

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APPENDIX: CHALLENGED CLAIM LISTING

Claim Designation	Claim Language
1.0 [PRE]	A system for providing real time indication of a hazardous vehicle condition comprising:
1.1	a server in communication with a first microprocessor of a first vehicle, the first microprocessor operative to receive a first communication sent from the first vehicle to the server indicating the first vehicle is in a hazardous condition and a location of the first vehicle;
1.2	wherein the server receives a second communication sent from a second vehicle to the server indicative of a location of the second vehicle; and
1.3	wherein the server provides a third communication to the second vehicle when it is determined that the locations of the first and second vehicle lie on a common roadway path and within a predetermined distance of one another.
2	The system of claim 1, wherein the second vehicle is equipped with a second microprocessor in communication with the server that provides an alert to an occupant of the second vehicle upon receipt of the third communication.
3	The system of claim 1, wherein the first microprocessor is in communication with a global positioning system associated with the first vehicle to determine the location of the first vehicle.
4	The system of claim 1, wherein the alert to the occupant of the second vehicle is a visual indication.
5	The system of claim 4 wherein the visual indication is provided on a heads-up display.
6	The system of claim 1, wherein the alert to the occupant of the second vehicle is an audio alert.
7	The system of claim 1, wherein the second vehicle is equipped

	with a high conspicuity external visual indicator that is activated when the alert is provided.
8	The system of claim 7, wherein the high conspicuity external visual indicator is activated to strobe the lights at the rear of the second vehicle.

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

Pursuant to 37 C.F.R. § 42.24 *et seq.*, the undersigned certifies that this document complies with the type-volume limitations. This document, excluding the portions identified under § 42.24(a)(1)—the table of contents, table of authorities, mandatory notices under § 42.8, certificates of service and compliance, appendix of exhibits, and claim listing—contains 13,993 words, as calculated by the word-processing program used to create it.

/Stephen D. Zinda/
Stephen D. Zinda

CERTIFICATE OF SERVICE

I hereby certify that on this 19th day of October 2026, a copy of the attached Petition for *Inter Partes* Review of U.S. Patent No. 12,109,938, and corresponding Exhibits 1001–1019, were served pursuant to Priority Mail Express (Next Day) on the following correspondence address of record with the United States Patent and Trademark for the challenged patent:

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UNITED STATES

I further certify that a copy of the foregoing Petition and corresponding exhibits were also provided via email to Patent Owner's attorneys of record in *Emergency Safety Solutions, Inc. v. HAAS, Inc.*, 1:26-cv-00838 (D. Del.):

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