IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

INTELLECTUAL VENTURES I LLC and INTELLECTUAL VENTURES II LLC,	)	
Plaintiffs,	)	C.A. No. 6:23-cv-00429
v.	)	
VOLVO CAR CORPORATION, VOLVO CARS OF NORTH AMERICA, LLC, and VOLVO CAR USA LLC,	)	**JURY TRIAL DEMANDED**
Defendants.	)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs Intellectual Ventures I LLC and Intellectual Ventures II LLC (collectively, "Intellectual Ventures" or "Plaintiffs"), in their Complaint of patent infringement against Defendants Volvo Car Corporation ("VC"), Volvo Cars North America, LLC ("VCNA"), and Volvo Cars USA, LLC ("VCUSA") (collectively, "Volvo" or "Defendants"), hereby allege as follows:

NATURE OF THE ACTION

1. This is a civil action for the infringement of United States Patent No. 6,832,283 ("the '283 Patent"), United States Patent No. 7,891,004 ("the '004 Patent"), United States Patent No. 9,232,158 ("the '158 Patent"), United States Patent No. 10,292,138 ("the '138 Patent"), United States Patent No. 8,953,641 ("the '641 Patent"), United States Patent No. 7,684,318 ("the '318 Patent"), United States Patent No. 9,602,608 ("the '608 Patent"), and United States

Patent No. 7,484,008 ("the '008 Patent") (collectively, the "Patents-in-Suit") under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq*.

THE PARTIES

Intellectual Ventures

2. Plaintiff Intellectual Ventures I LLC ("Intellectual Ventures I") is a Delaware limited liability company having its principal place of business located at 3150 139th Avenue SE, Bellevue, Washington 98005.

3. Plaintiff Intellectual Ventures II LLC ("Intellectual Ventures II") is a Delaware limited liability company having its principal place of business located at 3150 139th Avenue SE, Bellevue, Washington 98005.

4. Intellectual Ventures I is the owner of all rights, title, and interest in and to the '004 and '318 Patents. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '283, '158, '138, '641, '608, and '008 Patents.

Volvo

5. Upon information and belief, Defendant Volvo Car Corporation is a corporation organized and existing under the laws of Sweden with a principal place of business at Avd 50090, HB3S, 405 31 Gothenburg, Sweden. On information and belief, VC does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas.

6. Upon information and belief, Defendant Volvo Cars of North America, LLC is a corporation organized and existing under the laws of the State of Delaware with a principal place of business at 1 American Road - WHQ Room 612, Dearborn, Michigan 48126. On information and belief, VCNA is the wholly owned subsidiary of VC and provides marketing, sales, parts,

service, technology, and training support to Volvo automobile retailers in the United States.[1] On information and belief, VCNA is registered to do business in the State of Texas and has been since at least November 15, 2001, and may be served through its registered agent for service in the State of Texas, C.T. Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

7. Upon information and belief, Defendant Volvo Car USA LLC is a corporation organized and existing under the laws of the State of Delaware with a principal place of business at 1800 Volvo Place, Mahwah, New Jersey 07430. On information and belief, VCUSA is the wholly owned subsidiary of VCNA.[2] On information and belief, VCUSA is registered to do business in the State of Texas and has been since at least January 21, 2016, and may be served through its registered agent for service in the State of Texas, C.T. Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.[3]

8. On information and belief, Volvo designs, develops, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas automotive vehicles and components thereof that infringe the Patents-in-Suit, contributes to infringement by others, and/or induces others to commit acts of patent infringement in the State of Texas and the Western District of Texas.

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[1] *MicroPairing Technologies LLC v. Volvo Car USA LLC*, Case No. 6:21-cv-01108-ADA (W.D. Tex. Dec. 20, 2021) at Dkt. 9 (Defendant Volvo Car USA LLC's Corporate Disclosure Statement Under Federal Rule of Civil Procedure 7.1); Ex. 1, https://www.media.volvocars.com/ca/en-ca/media/pressreleases/14819 (last accessed on June 5, 2023).

[2] *MicroPairing Technologies LLC v. Volvo Car USA LLC*, Case No. 6:21-cv-01108-ADA (W.D. Tex. Dec. 20, 2021) at Dkt. 9 (Defendant Volvo Car USA LLC's Corporate Disclosure Statement Under Federal Rule of Civil Procedure 7.1).

[3] *MicroPairing Technologies LLC v. Volvo Car USA LLC*, Case No. 6:21-cv-01108-ADA (W.D. Tex. Dec. 20, 2021) at Dkt. 8, Volvo's Answer to Complaint for Patent Infringement at ¶ 2.

9. Volvo has regular and established places of business, at which it has committed acts of infringement and placed the accused products into the stream of commerce, throughout the State of Texas and in the Western District of Texas, including at least (1) Volvo Cars of Temple located at 5700 SW H K Dodgen Loop, Temple, Texas 76502, (2) Volvo Cars of Austin located at 7216 N Interstate Hwy 35, Austin, Texas 78752, (3) Principle Volvo Cars San Antonio located at 1326 NE Interstate 410 Loop, San Antonio, Texas 78209; and (4) Giles Volvo Cars El Paso located at 6585 S Desert Boulevard, El Paso, Texas 79932 ("Volvo dealers").

10. Volvo Dealers offer and/or participate in Volvo's implementation of a subscription service called Care by Volvo ("CbV").

11. CbV is Volvo's all-inclusive car subscription that charges a monthly all-inclusive fee direct to consumers via Volvo's website. Customers are allowed to choose their preferred retailers and they are contacted to schedule a time to pick up their vehicle. *See* Volvo Cars US website, available at: https://www.volvocars.com/us/care-by-volvo/ (last accessed on June 5, 2023) (Ex. 2, "Subscribing online is easy & negotiation free. Choose your preferred retailer, and we will contact you to schedule a time to pickup your vehicle.")

12. CbV is offered in the State of Texas and Volvo Dealers locations come up when the "Find a Retailer" link on the CbV website is followed and therefore, upon information and belief, are participating in CbV. Ex. 3, (Volvo Dealers Linked to CbV).

13. Upon information and belief, as participating dealers, Volvo Dealers were required to sign a dealer lease agreement addendum ("the Addendum") that made Volvo Dealers agents of Volvo. *See* Ex. 4, California Department of Transportation Agency Report, at 2.

14. Upon information and belief, the Addendum allowed Volvo to control how Volvo Dealers offered CbV and to use Volvo Dealers employees to consummate CbV transactions. *See* Ex. 4, California Department of Transportation Agency Report[4], at 2-3.

15. Upon information and belief, when Volvo had the Volvo Dealers sign the Addendum, it made Volvo Dealers agents of Volvo, rather than independent of Volvo as in the franchise agreement. *See* Ex. 4, California Department of Transportation Agency Report, at 2-3.

16. When Volvo Dealers signed the Addendum, they became an agent of Volvo. "Dealers were required to sign the Addendum to participate in CbV. When a dealer signed, they became an agent of Volvo." *See* Ex. 4, California Department of Transportation Agency Report, at 4.

17. CbV was investigated by the California State Transportation Agency and a report was issued regarding CbV on February 11, 2020.

18. The California State Transportation Agency Report stated "A review of Volvo's website, Volvo Car USA Memo, dated November 22, 2017, and CbV dealer transactions and file reviews, showed that CbV transactions originate with the consumer going online to the CbV website, selecting a participating Volvo model and placing an order. Volvo confirms the consumer is credit and insurance eligible. Volvo confirms the order and a Volvo Concierge coordinates a time and date between the consumer and dealer for delivery. The dealer is recommended to the consumer based on the consumer's zip code, however, the consumer may select a Volvo dealer of their choice. After a date and time is confirmed for delivery the vehicle is wholesale and delivered

[4] Ex. 4, California State Transportation Agency Report, available at: https://www.nmvb.ca.gov/publications/p460/P-460-19_Report_of_Investigation.pdf?utm_source=hs_email&utm_medium=email&_hsenc=p2ANqtz-_qq6e8qVDc8K72nbAwbnam5hMNxfA16kt-ZV9E6BajDU9adSN0YZjik5FxGCFxXUoHhBKI (last accessed on June 7, 2023).

to the dealer. The vehicle is invoiced to the dealer and placed in dealer inventory." *See* Ex. 4, California Department of Transportation Agency Report, at 4.

19. "The California State Transportation Agency Report Volvo is competing with each dealer in the R[elevant]M[market]A[rea] through the dealership property **using a dealer employee as its own agent**." *See* Ex. 4, California Department of Transportation Agency Report, at 8-9 (emphasis added).

20. Volvo Dealers therefore are Volvo's regular and established places of business under Section 1400(b) and *In re Volkswagen Group of America, Inc.*, No. 2022-108 (Fed. Cir. Mar. 9, 2022) because by implementing CbV Volvo Dealers are: (1) agents of Volvo; (2) conducting Volvo's business; and (3) have been ratified by Volvo as places of business (*e.g.* picking up cars customers purchase directly from Volvo at Volvo Dealers).

21. Volvo further controls how Volvo Dealers offer CbV and use Volvo Dealer's employees to consummate CbV transactions.

22. Volvo's implementation of CbV via the Addendum and/or other means allows Volvo to control and direct Volvo Dealer's actions and manifest Volvo's consent that Volvo Dealers act as agents on Volvo's behalf.

23. Volvo Dealers by signing the Addendum and/or participating in CbV consent to act on Volvo's behalf.

24. Volvo Dealers are therefore agents of Volvo and/or have given Volvo the right to control Volvo Dealer's acts throughout the course of the relationship.

25. Upon information and belief, each of these authorized Volvo dealers in this District are regular, continuous, and established physical places of business of Volvo, being established, ratified, and/or controlled by Volvo as authorized dealers, which are the exclusive places of

business at which Volvo offers for sale, sells, and provides authorized warranty, maintenance, and recall services for the Volvo automotive vehicles and components that infringe the Patents-in-Suit.

26. Upon information and belief, Volvo granted each of these authorized Volvo dealers in this District the exclusive right to offer for sale, sell, and service the infringing Volvo vehicles in this District, at these particular geographical locations, and has further conditioned these authorized dealers' continued offering for sale, sale, and service of the infringing Volvo vehicles in this District on these authorized dealers' continued presence in this District, at these particular geographical locations, so that the infringing Volvo automobiles and components are offered for sale, sold, and/or otherwise distributed in this District.

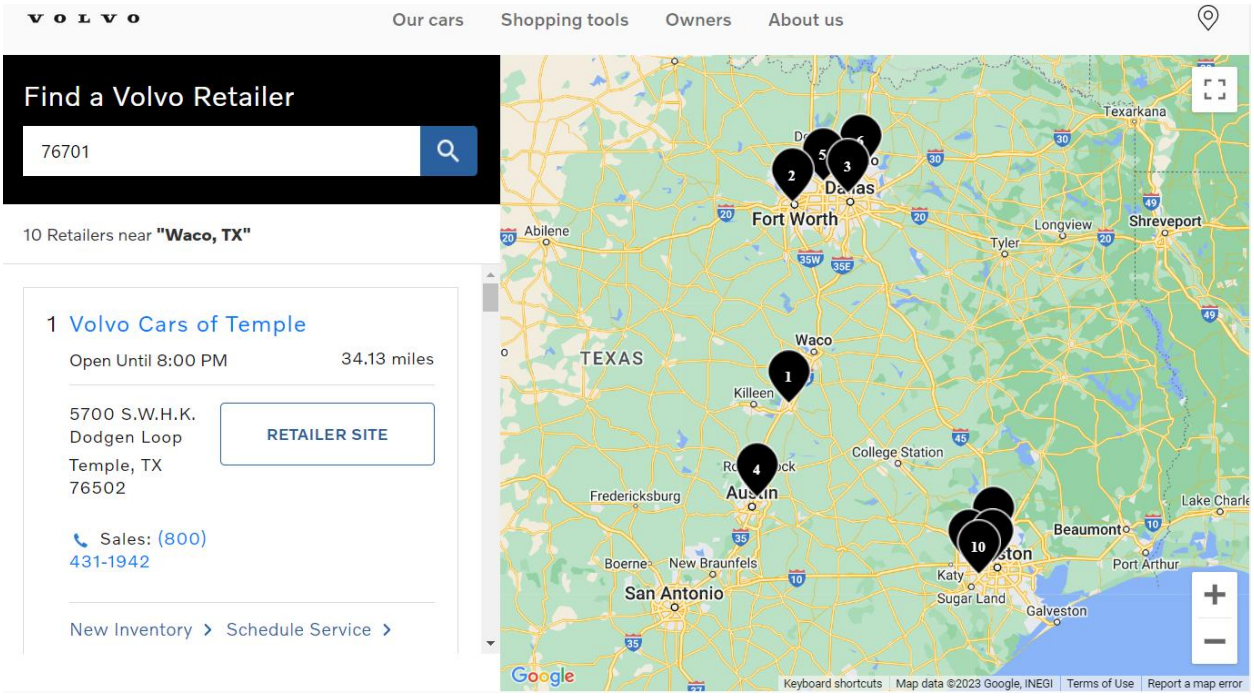
27. Upon information and belief, Volvo does not permit sales of any new Volvo vehicles from any location except its authorized Volvo dealers, such as Volvo Cars of Temple, Volvo Cars of Austin, Principle Volvo Cars San Antonio, and/or Giles Volvo Cars El Paso.

28. Upon information and belief, each of these authorized Volvo dealers in this District are regular, continuous, and established physical places of business of Volvo, being established, ratified, and/or controlled by Volvo as authorized dealers, which are the exclusive places of business at which Volvo offers for sale, sells, and provides authorized warranty, maintenance, and recall services for the Volvo automotive vehicles and components that infringe the Patents-in-Suit.

29. Upon information and belief, Volvo ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by listing each of them on Volvo's website(s), including, *e.g.*, as shown below[5]:

[5] Ex. 3, https://www.volvocars.com/us/dealer-locator/ (last accessed on June 8, 2023).

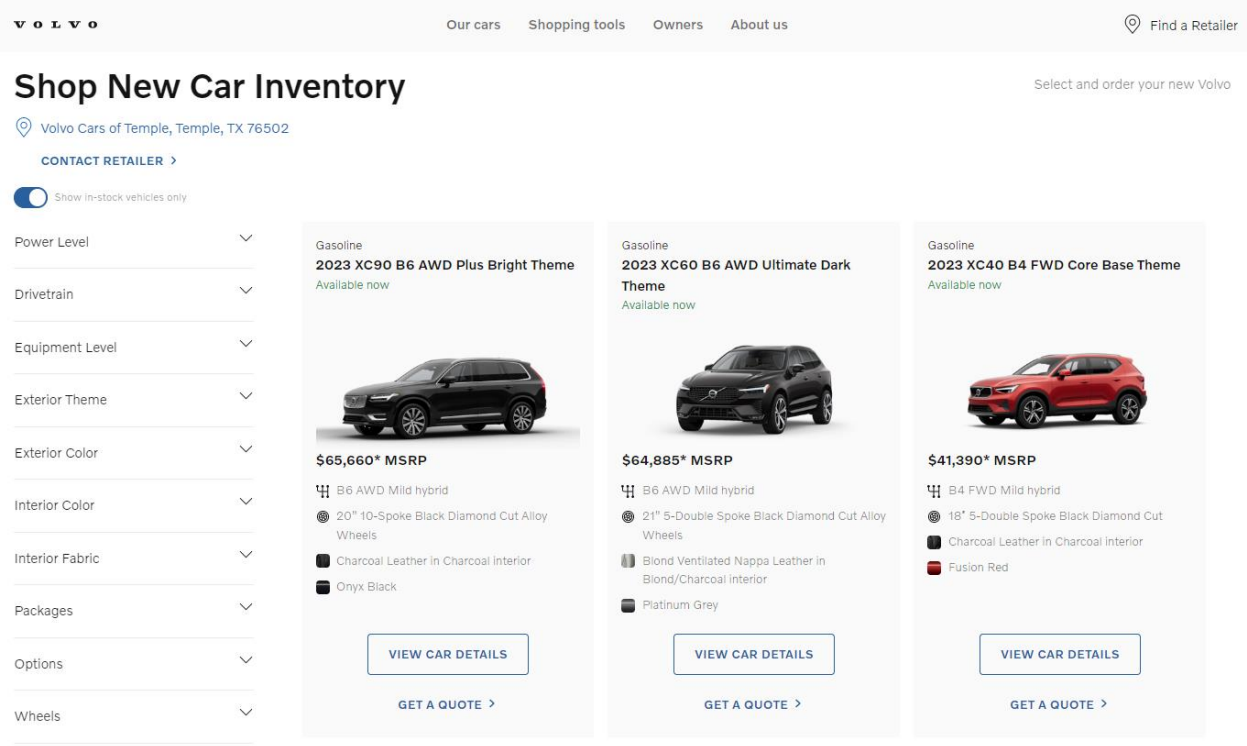
Figure 1



30. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by offering for sale on Volvo's website(s) the infringing automobiles and components at the physical, geographical locations of these authorized Volvo dealers, including, *e.g.*, as shown below[6]:

[6] Ex. 5, https://www.volvocars.com/us/inventory/car-locator/6US4285?gclsrc=aw.ds&gclid=EAIaIQobChMIl4S12qOf_wIVWS3UAR1VyQuREAAYASABEgK2C_D_BwE (last accessed on June 5, 2023).

Figure 2



31. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by requiring these authorized dealers to feature and use Volvo names, branding, trademarks, and/or trade dress, in each of these authorized dealers' names, including at least Volvo Cars of Temple, Volvo Cars of Austin, Principle Volvo Cars San Antonio, and Giles Volvo Cars El Paso, as well as in the marketing and advertising materials that these authorized dealers use and make to offer for sale and sell the infringing automobiles and components in this District – including on each authorized dealer's website hosted, maintained, and shown to consumers in this District.

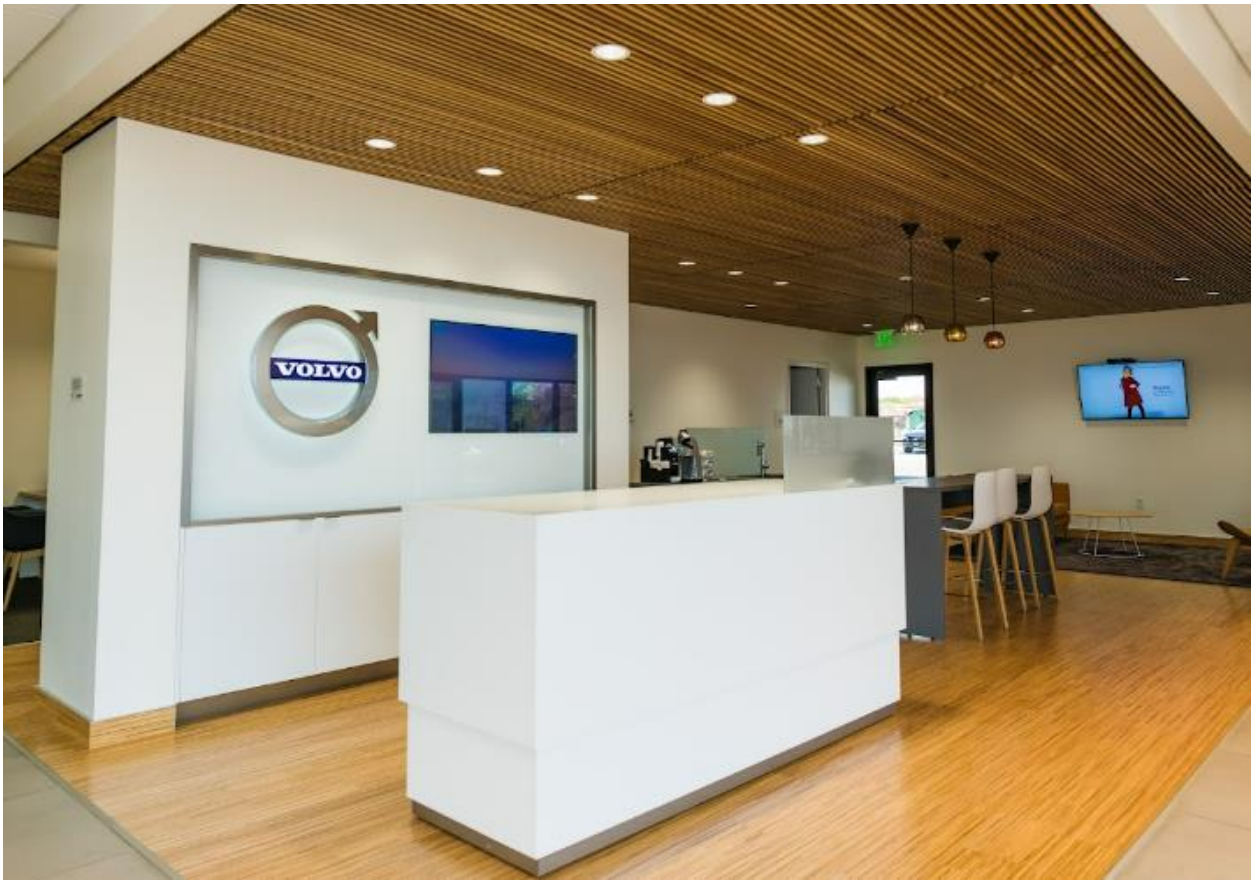
32. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by controlling in whole or in part the name, geographical location, design, layout, marketing, and

branding of these places to test drive and purchase the infringing Volvo automobiles and components, including, *e.g.*, as shown in below photographs of Volvo Cars of Temple:

Figure 3

Figure 4

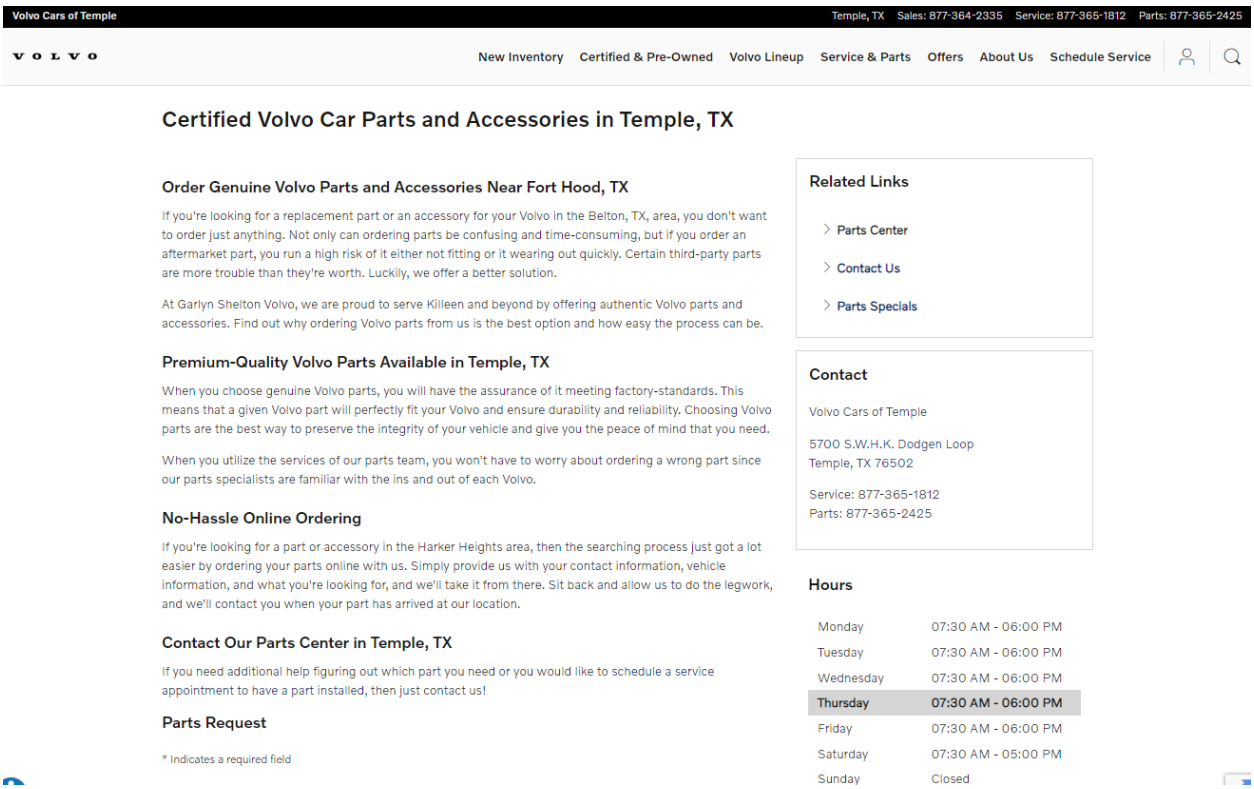
Figure 5



33. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by requiring these businesses to store, display, and/or distribute marketing materials, informational brochures, product specifications, service information, warranty information, lease information, financing information, and various other literature, as well as Volvo authorized service, parts, and accessories, for the infringing automobiles and components, including, *e.g.*, as shown below[7]:

[7] Ex. 6, https://www.templevolvo.com/parts/index.htm (last accessed on June 5, 2023).

Figure 6



34. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by establishing, authorizing, and requiring these places of business to offer to consumers in this District, at the time of sale and/or distribution of the infringing automobiles and components, Volvo financial services and products, Volvo warranties, Volvo service from Volvo certified and/or trained technicians, Volvo parts, and Volvo accessories, including, *e.g.*, as shown below[8]:

[8] Ex. 7, https://www.templevolvo.com/schedule-service.htm?ddcref=fluency&tcdcmpid=554107&tcdadid=607897135190&tcdkwid=322477784&gclid=EAIaIQobChMI8OCVtpGj_wIVus_ICh1c8AppEAAYASAAEgKX5fD_BwE (last accessed on June 5, 2023).

Figure 7

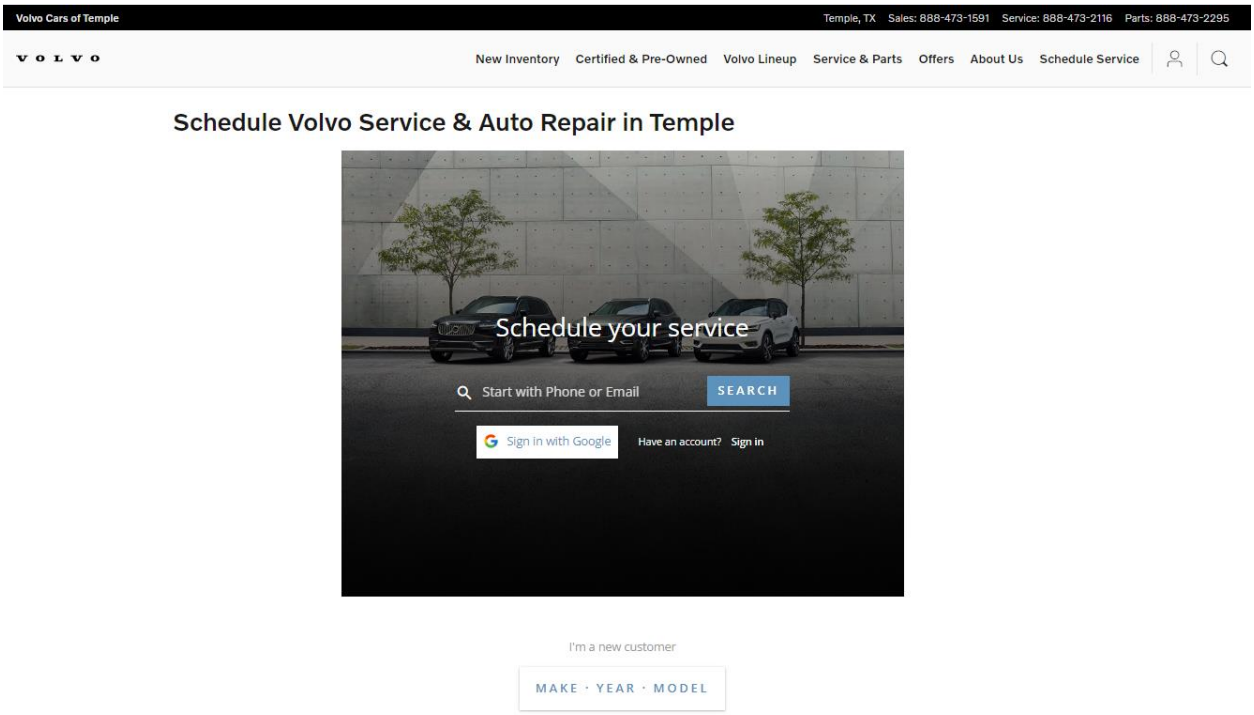


Figure 8

Schedule Auto Service at Volvo Cars of Temple in Temple, TX

Routine service and maintenance are essential to keep your vehicle in the best possible condition, but when your local Harker-Heights area mechanics offer long wait times and pricey services, it's understandable why you might want to put off service. At Volvo Cars of Temple, we serve Fort Hood, TX, by offering affordable prices, expert service, and convenience at every turn.

Find out why so many from the Killeen area trust us with their vehicles.

Easy Online Service Scheduling Near Belton, TX

While scheduling service by phone is quick and easy, there is an alternative. If you prefer not to pick up your phone, then just use our online scheduling tool. By giving some basic information about your vehicle, the service you're looking for, when works for you, and how to contact you, you can schedule auto service without needing to talk on the phone.

You will discover that it's quick and effortless to schedule an appointment online. Follow the intuitive directions and schedule an appointment with our highly skilled technicians in no time.

Why Choose Our Service Center?

Our technicians have been factory-trained to repair and service Volvo cars, meaning that your Volvo will receive top-shelf care and attention. Our state-of-the-art facility and advanced diagnostic tools also help to speed up the process and ensure a high degree of quality. When you bring our Volvo to us in Temple, TX, you can count on it receiving expert attention and genuine Volvo parts.

Some of the services that our Temple, TX service center offers include:

- Oil Change
- Cabin Air Filter Replacement
- Heating and Cooling Component Repair
- Wheel Alignment
- Tire Rotation

Schedule Auto Service with Us Today

If it's time for routine maintenance or a more thorough repair, then discover the convenience of scheduling online with our online scheduling tool. Take a minute to fill in the information required, and our service center will contact you shortly after to confirm your appointment. We look forward to hearing from you!

35. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by recruiting, hiring, training, offering compensation and benefits to, controlling, and/or labeling as authorized or certified Volvo employees and agents some or all of the employees or agents employed in this District by these authorized dealers, including for example, Volvo certified brand advisors, Volvo certified technicians, and Volvo certified service advisors.

36. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo by providing these dealers sales promotions, providing these dealers financing for dealership improvements directed by Volvo, and sharing customer data with these dealers to provide customized Volvo services.

37. Upon information and belief, Volvo further ratifies and holds these authorized Volvo dealers out as the regular and established places of business of Volvo in this District by establishing, authorizing, and requiring consumers in this District to visit and use these authorized dealers in order to obtain authorized Volvo service, obtain scheduled maintenance under any Volvo service plan, make repairs pursuant to any Volvo warranty, or obtain any recall work for all new Volvo automobiles and components, including the infringing automobiles and components.

38. Upon information and belief, Volvo has established and ratified and holds these authorized Volvo dealers out as the regular and established places of business of Volvo by directing and controlling these authorized dealers' actions, sales, and services in the foregoing manner, and has consented to these authorized dealers acting on Volvo's behalf and being the exclusive places of business whereby the infringing automobiles and components are distributed, offered for sale, sold, and serviced in order to place these infringing articles into the stream of commerce in this District, and these authorized dealers have consented to act on Volvo's behalf

pursuant to the foregoing terms of control and direction in order to be able to provide these Volvo automobiles, components, and services to consumers in this District.

JURISDICTION AND VENUE

39. This is an action for patent infringement arising under the Patent Laws of the United States. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

40. This Court has personal jurisdiction over Volvo because Volvo conducts business in and has committed acts of patent infringement, contributed to infringement by others, and/or induced others to commit acts of patent infringement in this District, the State of Texas, and elsewhere in the United States and has established minimum contacts with this forum state such that the exercise of jurisdiction over Volvo would not offend the traditional notions of fair play and substantial justice. Upon information and belief, Volvo transacts substantial business with entities and individuals in the State of Texas and the Western District of Texas, by among other things, importing, offering to sell, distributing, and selling products that infringe the Patents-in-Suit, including the infringing automotive vehicles and components thereof that Volvo purposefully directs into the State of Texas and this District as alleged herein, as well as by providing service and support to its customers in this District. Volvo places the accused automotive vehicles and components thereof into the stream of commerce via authorized and established distribution channels with the knowledge and expectation that they will be sold in the State of Texas, including this District, and do not otherwise permit the sale of the accused automotive vehicles and components thereof in the State of Texas, or in this District, outside of these established, authorized, and ratified distribution channels and dealer networks.

41. Volvo is subject to this Court's general and specific jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to Volvo's substantial business in the State of Texas and this District, including through its past infringing activities, because Volvo regularly does and solicits business herein, and/or because Volvo has engaged in persistent conduct and/or has derived substantial revenues from goods and services provided to customers in the State of Texas and this District.

42. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b)-(c) and 1400(b) because Volvo has committed acts of infringement in this District and Volvo Dealers in this District constitute regular and established places of business in this district pursuant to *In re Volkswagen Group of America, Inc.*, No. 2022-108 (Fed. Cir. Mar. 9, 2022).

43. VCUSA has previously admitted that "new Volvo vehicles are exclusively available for purchase through authorized dealers of Volvo Car USA, LLC." *See MicroPairing Technologies LLC v. Volvo Car USA LLC*, Case No. 6:21-cv-01108-ADA (W.D. Tex. Dec. 20, 2021) at Dkt. 8, Volvo's Answer to Complaint for Patent Infringement at ¶ 12.

44. VCUSA has previously admitted that it "has a regular and established place of business in this District and conducts business in this District." *See id.* at ¶ 4.

45. VCUSA has previously consented to general and specific personal jurisdiction in this District. *See id.* at ¶ 5 ("For the purposes of this action, Volvo does not contest general and specific personal jurisdiction").

46. VCUSA has previously consented to venue in this District. *See id.* at ¶ 12 ("For the purposes of this action, Volvo does not contest venue in this District.")

FACTUAL BACKGROUND

47. Intellectual Ventures Management, LLC ("Intellectual Ventures Management") was founded in 2000. Since then, Intellectual Ventures Management has been involved in the business of inventing. Intellectual Ventures Management creates inventions and files patent applications for those inventions; collaborates with others to develop and patent inventions; and acquires and licenses patents from individual inventors, universities, corporations, and other institutions. A significant aspect of Intellectual Ventures Management's business is managing the plaintiffs in this case, Intellectual Ventures I and Intellectual Ventures II.

48. One of the founders of Intellectual Ventures Management is Nathan Myhrvold, who worked at Microsoft from 1986 until 2000 in a variety of executive positions, culminating in his appointment as the company's first Chief Technology Officer ("CTO") in 1996. While at Microsoft, Dr. Myhrvold founded Microsoft Research in 1991 and was one of the world's foremost software experts. Between 1986 and 2000, Microsoft became the world's largest technology company.

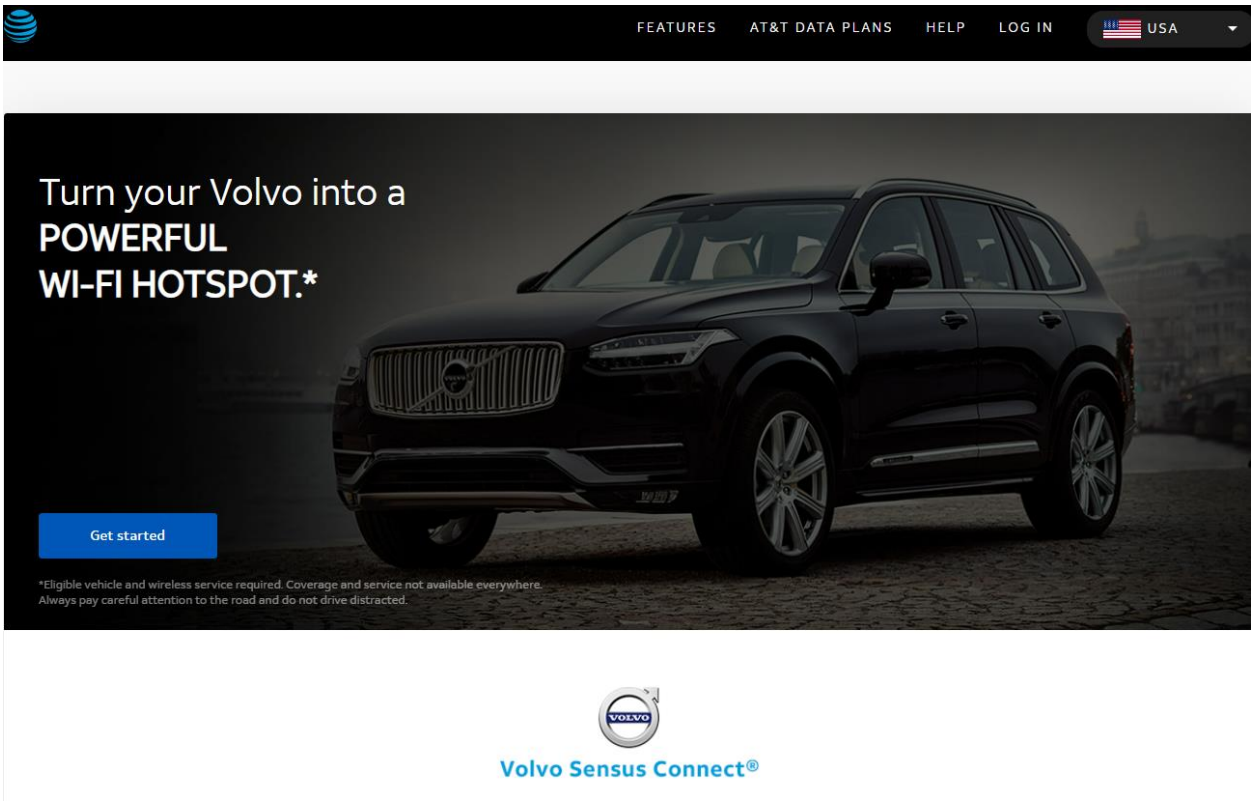
49. Under Dr. Myhrvold's leadership, Intellectual Ventures acquired more than 70,000 patents covering many important inventions of the Internet era. Many of these inventions coincided with Dr. Myhrvold's successful tenure at Microsoft.

50. One of the most significant accomplishments of the Internet era is the emergence of wireless technologies for vehicles. Wireless connectivity systems in vehicles enable communication channels within vehicles as well as with other external networks. Intellectual Ventures' Patents-In-Suit provide improvements to wireless communications used in vehicles.

51. Volvo provides several types of wireless communication system solutions and services to their customers. Volvo's product offerings include but are not limited to: Sensus

Connect. Volvo markets and sells these wireless communication system solutions and services in several Volvo models throughout the world, including in the United States and Texas, *e.g.*, as shown below[9]:

Figure 9



[9] Ex. 8, https://myvehicle.att.com/#/volvo/learn?language=en&country=US (last accessed on June 5, 2023).

Figure 10

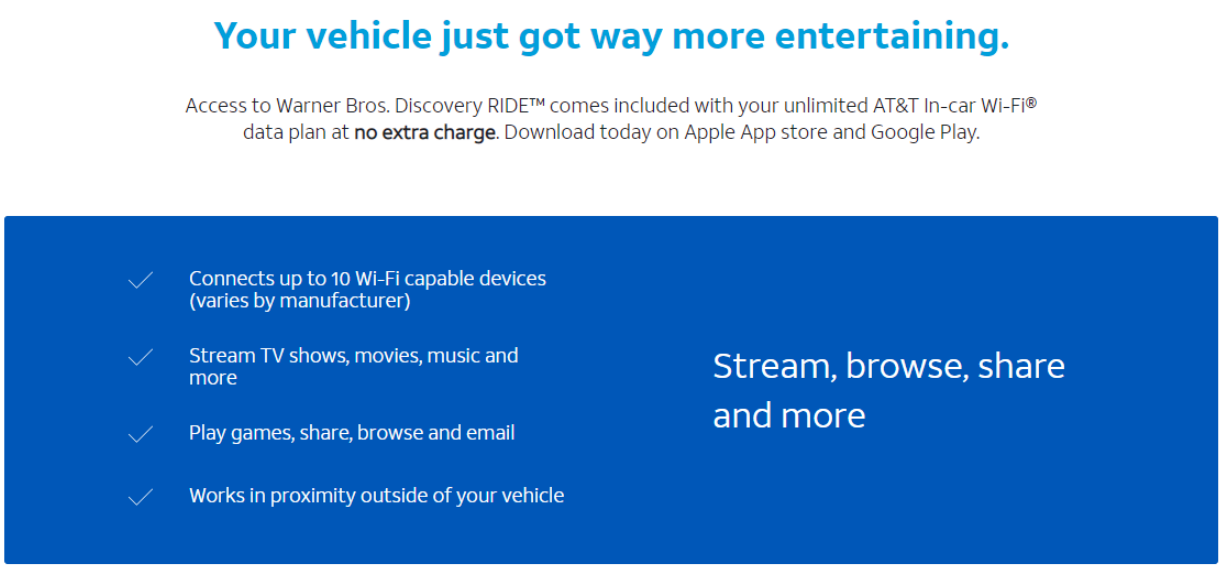
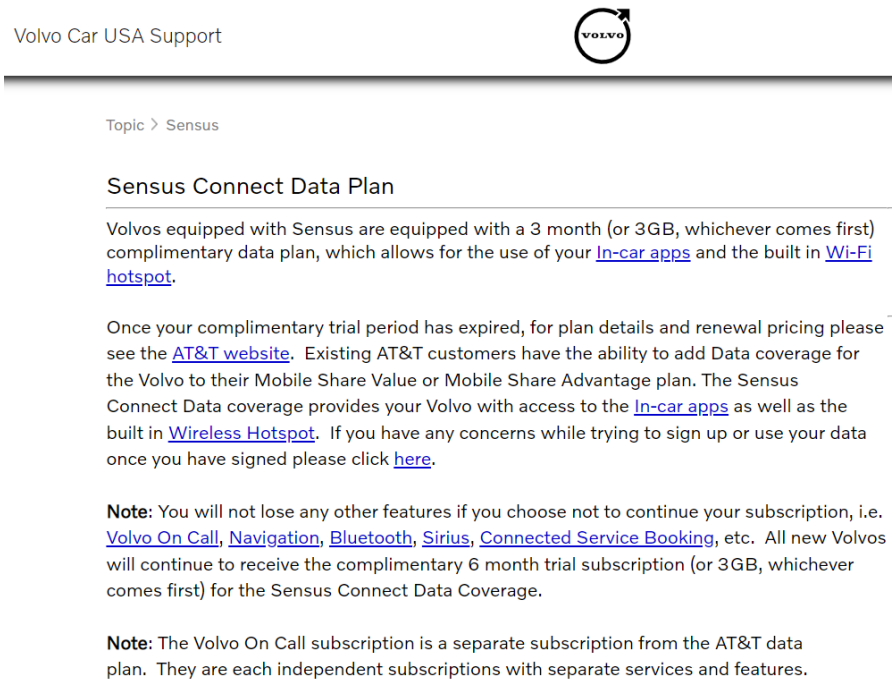

Your vehicle just got way more entertaining.
Access to Warner Bros. Discovery RIDE™ comes included with your unlimited AT&T In-car Wi-Fi® data plan at no extra charge. Download today on Apple App store and Google Play.
Connects up to 10 Wi-Fi capable devices (varies by manufacturer)
Stream TV shows, movies, music and more
Play games, share, browse and email
Works in proximity outside of your vehicle
Stream, browse, share and more
AT&T IN-CAR WI-FI® DATA PLANS
AT&T WIRELESS CUSTOMERS

Figure 11[10]



[10] Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

Figure 12[11]

To check your data usage in your Volvo to determine the best plan coverage for your Volvo please follow the instructions below:

1. Press the MY CAR button twice
2. Select Internet settings
3. Select Car Modem and the Data usage will be displayed

Note: Please understand that certain activities will use up your data much faster than others; i.e. streaming audio and/or video (especially in higher quality) consumes more data than simply surfing the web while connected to the hotspot. Data usage varies by device. A device connected to the wi-fi hotspot in the vehicle will behave just like on an in-home wi-fi network; e.g. app updates or iTunes downloads that you have restricted from running on a cellular network, will resume when the device is connected to the hotspot.

THE PATENTS-IN-SUIT

U.S. Patent No. 6,832,283

52. On December 14, 2004, the PTO issued the '283 Patent, titled "METHOD FOR ADDRESSING NETWORK COMPONENTS." The '283 Patent is valid and enforceable. A copy of the '283 Patent is attached as Exhibit 10.

53. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '283 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '283 Patent.

54. The '283 Patent generally relates to systems and methods for addressing components of a network, especially in the case of data bus systems in transport means, in which

[11] Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

each component is assigned a first address for the mutual communication within the network and the first addresses are stored in a central register. The network addressing systems and methods covered by the '283 Patent include addressing components of a first network, especially in the case of data bus systems in transport vehicles, in which each component is assigned a first address for the mutual communication within the network and the first addresses are stored in a central register, in which at least one particular component of the first network communicates with another network, this component, when dialing into the second network, is assigned a second address by the latter and, within the first network, addressing takes place on the basis of function-specific address components, identical function blocks of the components being addressed via identical function-specific address components.

U.S. Patent No. 7,891,004

55. On February 15, 2011, the PTO issued the '004 Patent, titled "METHOD FOR VEHICLE INTERNETWORKS." The '004 Patent is valid and enforceable. A copy of the '004 Patent is attached as Exhibit 11.

56. Intellectual Ventures I is the owner of all rights, title, and interest in and to the '004 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '004 Patent.

57. The '004 Patent generally relates to intelligent networks that include connections to the physical world. For example, the invention relates to providing distributed network and Internet access to processors, controls, and devices in vehicles. The networks covered by the '004 Patent provide for communications among diverse electronic devices within a vehicle, and for communications among these devices and networks external to the vehicle. The networks covered by the '004 Patent comprise specific devices, software, and protocols, and provide for security for essential vehicle functions and data communications, ease of integration of new

devices and services to the vehicle internetwork, and ease of addition of services linking the vehicle to external networks such as the Internet.

U.S. Patent No. 9,232,158

58. On January 5, 2016, the PTO issued the '158 Patent, titled "LARGE DYNAMIC RANGE CAMERAS." The '158 Patent is valid and enforceable. A copy of the '158 Patent is attached as Exhibit 12.

59. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '158 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '158 Patent.

60. The '158 Patent generally relates to optical devices and more particularly to expanding the dynamic exposure range in digital cameras.

U.S. Patent No. 10,292,138

61. On May 14, 2019, the PTO issued the '138 Patent, titled "DETERMINING BUFFER OCCUPANCY AND SELECTING DATA FOR TRANSMISSION ON A RADIO BEARER." The '138 Patent is valid and enforceable. A copy of the '138 Patent is attached as Exhibit 13.

62. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '138 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '138 Patent.

63. The '138 Patent relates to mechanisms to support Internet Protocol data flows within a wireless communication system, applicable to, but not limited to, gateway queuing algorithms in packet data transmissions, for example, for use in mobile telecommunications. The products and methods covered by the '138 Patent relate to user equipment (UE) that may determine and transmit to a network buffer occupancy associated with one or more radio bearers, and may

select data for transmission from radio bearers using a received single allocation of uplink resources.

U.S. Patent No. 8,953,641

64. On February 10, 2015, the PTO issued the '641 Patent, titled "METHODS AND APPARATUS FOR MULTI-CARRIER COMMUNICATIONS WITH VARIABLE CHANNEL BANDWIDTH". The '641 Patent is valid and enforceable. A copy of the '641 Patent is attached as Exhibit 14.

65. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '641 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '641 Patent.

66. The '641 Patent relates to methods and apparatus for multi-carrier communication with variable channel bandwidth.

U.S. Patent No. 7,684,318

67. On March 23, 2010, the PTO issued the '318 Patent, titled "SHARED-COMMUNICATIONS CHANNEL UTILIZATION FOR APPLICATIONS HAVING DIFFERENT CLASS OF SERVICE REQUIREMENTS". The '318 Patent is valid and enforceable. A copy of the '318 Patent is attached as Exhibit 15.

68. Intellectual Ventures I is the owner of all rights, title, and interest in and to the '318 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '318 Patent.

69. The '318 Patent relates to telecommunications in general, and, more particularly, to a technique for enabling the stations in a local area network to intelligently use their shared-communications channel. For example, at least one of the inventions set forth in the '318 Patent enables latency-tolerant and latency-intolerant applications to intelligently share a shared-

communications channel in a manner that seeks to satisfy the needs of all of the applications. An illustrative embodiment enables each application to be associated with a different class of service, wherein each class of service is associated with one or more quality-of-service parameters (*e.g.*, minimum throughput, maximum latency, etc.).

U.S. Patent No. 9,602,608

70. On March 21, 2017, the PTO issued the '608 Patent, titled "SYSTEM AND METHOD FOR NOTIFYING A USER OF PEOPLE, PLACES OR THINGS HAVING ATTRIBUTES MATCHING A USER'S STATED PREFERENCE". The '608 Patent is valid and enforceable. A copy of the '608 Patent is attached as Exhibit 16.

71. Intellectual Ventures II is the owner of all rights, title, and interest in and to the '608 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the '608 Patent.

72. The '608 Patent relates to communications systems and methods for providing localized resource information to mobile customers based on their explicit preferences that match profiles of media content about people, places and things. The communication systems, apparatus, and methods covered by the '608 Patent include location-based and preference-based systems and methods for matching media content about persons, places and things with the expressed preferences of mobile users to notify users about and provide users with access to media content about persons, places and things that match the user's expressed preferences. The systems covered by the '608 Patent provide information such as stories or articles that match the user's interests and relate to their location.

U.S. Patent No. 7,484,008

73. On January 27, 2009, the PTO issued the ’008 Patent, titled “APPARATUS FOR VEHICLE INTERNETWORKS.” The ’008 Patent is valid and enforceable. A copy of the ’008 Patent is attached as Exhibit 17.

74. Intellectual Ventures I is the owner of all rights, title, and interest in and to the ’008 Patent, and holds all substantial rights therein, including the right to grant licenses, to exclude others, and to enforce and recover past damages for infringement of the ’008 Patent.

75. The ’008 Patent generally relates to intelligent vehicle networks that include connection to the physical world. In particular, the invention relates to providing distributed network and Internet access to processors, controls, and devices in vehicles. The vehicle networks covered by the ’008 Patent include internetworks that provide for communications among diverse electronic devices within a vehicle, and for communications among these devices and networks external to the vehicle. The vehicle internetwork comprises specific devices, software, and protocols, and provides for security for essential vehicle functions and data communications, ease of integration of devices and services to the vehicle internetwork, and ease of addition of services linking the vehicle to external networks such as the Internet.

COUNT I

(Volvo’s Infringement of U.S. Patent No. 6,832,283)

76. Paragraphs 1-75 are incorporated by reference as if fully set forth herein.

77. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the ’283 Patent, by making, using, performing, testing, leasing, selling, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the ’283 Patent including, but not

limited to the C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge (collectively, "Volvo Count I Automobiles").

78. As an exemplary claim, Claim 1 of the '283 Patent is reproduced below:

> *1. Method for addressing components of a first network in a data bus system in a transport vehicle, in which each component is assigned a first address for mutual communication within the network and the first addresses are stored in a central register, wherein at least one particular component of the first network communicates with a second network, said one component, when dialling into the second network, is assigned a second address by the second network, and wherein, within the first network, addressing takes place on the basis of function-specific address components, identical function blocks of the components being addressed via identical function-specific address components.*

79. Upon information and belief, Volvo and the Volvo Count I Automobiles perform each and every limitation of at least claim 1.

80. Upon information and belief, the Volvo Count I Automobiles include the Volvo systems that use the MOST Automotive Multimedia Network ("MOST"), as indicated in the examples below. Upon information and belief, the Volvo Count I Automobiles include a first network of components in data bus systems using, for example, MOST networks.

CHANDLER, Ariz., May 26, 2015 — Microchip Technology Inc. **(NASDAQ: MCHP)**, a leading provider of microcontroller, mixed-signal, analog and Flash-IP solutions, today announced that the Volvo Car Group smoothly migrated from MOST25 to the latest MOST150 standard in its all-new **Volvo XC90** model, using Microchip's **OS81110 Intelligent Network Interface Controllers** (INICs). After many years of using Microchip's MOST25 INICs, Volvo Cars needed to enable its latest infotainment systems with the ability to carry Ethernet packets. MOST150 was a natural choice because, in addition to all of its other features, it is the first and only standard to provide a proven, automotive-ready physical layer for Ethernet packet transport inside cars. And it does so in accordance with the IEEE 802.3 Ethernet specifications.

See Ex. 18, 5/26/15 Microchip Technology Inc. Press Release (available at http://ww1.microchip.com/downloads/pr_archive/en/volvo-cars-selects-microchips.pdf (last accessed on June 5, 2023)).

CHANDLER, Ariz., Jan. 19, 2016 — Microchip Technology Inc. **(NASDAQ: MCHP)**, a leading provider of microcontroller, mixed-signal, analog and Flash-IP solutions, today announced that **MOST150 Technology** has been implemented in the new Volvo S90. This is the second Volvo model where its infotainment system includes MOST150 technology. Volvo Cars has been utilizing Microchip's technology for many years and recently began utilizing MOST150, the latest MOST® technology from Microchip. MOST150 is the first standard to provide a proven, automotive-ready physical layer for Ethernet packet transport inside vehicles in accordance with the IEEE 802.3 Ethernet specifications.

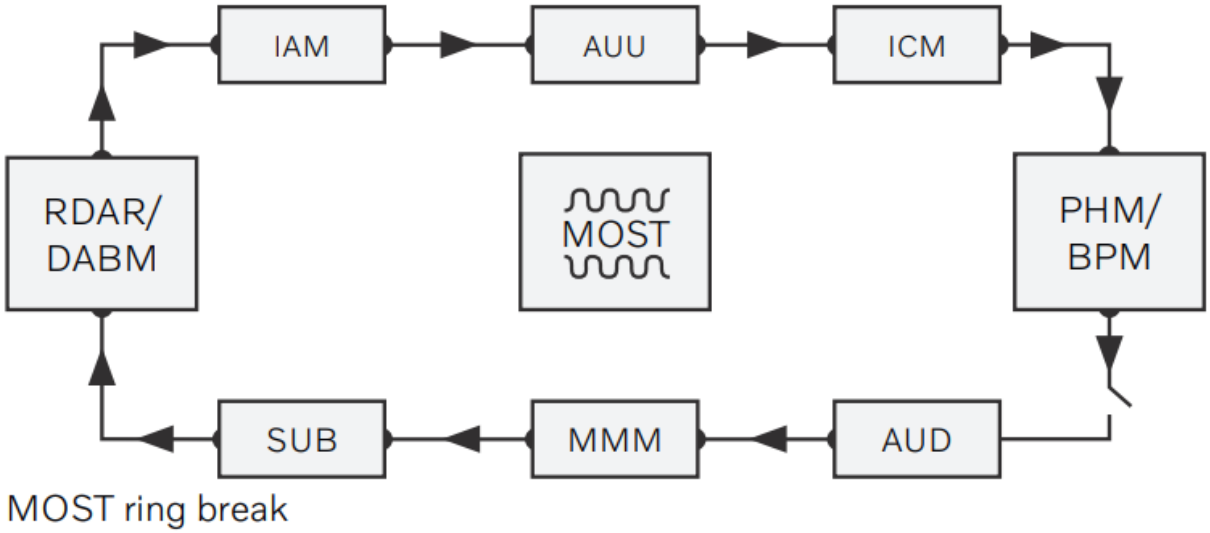
See Ex. 19, 1/19/16 Microchip Technology Inc. Press Release (available at https://www.microchip.com/en-us/about/news-releases/corporate/microchip-s-most150-technology-implemented-in-the-new-volvo-s90 (last accessed on June 7, 2023)).

CHANDLER, Ariz., July 18, 2017 — Media Oriented System Transport (MOST®) technology, developed by Microchip Technology Inc. **(NASDAQ: MCHP),** will network the in-vehicle infotainment system of Volvo Cars' second-generation XC60 SUV. The highly publicized Volvo XC60 will be the fourth Volvo model to implement MOST150 technology, which continues to meet Volvo's high standards for in-vehicle infotainment. Volvo Cars has been utilizing Microchip's MOST technology for years to provide the highest-quality digital multichannel audio streaming.

See Ex. 20, 7/18/17 Microchip Technology Inc. Press Release (available at https://www.microchip.com/en-us/about/news-releases/corporate/most150-technology-to-control-the-infotainment-system-on-volvo-cars-second-generation-xc60-suv (last accessed on June 7, 2023)).

> MOST technology is used in almost every car brand worldwide, including Audi, BMW, GM, Honda, Hyundai, Jaguar, Lancia, Land Rover, Mercedes-Benz, Porsche, Toyota, VW, SAAB, Skoda, Seat and, of course, Volvo.

See Ex. 21 at p. 7, Volvo MOST Networks and Infotainment Systems Problems and Solutions (available at https://automotivetechinfo.com/wp-content/uploads/2021/05/Volvo-MOST-Networks-and-Infotainment-Systems-Problems-and-Solutions.pdf (last accessed on June 5, 2023)).



Id. at p. 10.

81. Upon information and belief, the Volvo Count I Automobiles using, for example, MOST, address the components in the first network, in which each component is assigned a first address for mutual communication within the network, addressing takes place on the basis of function-specific address components, identical function blocks of the components being addressed via identical function-specific address components.

2.1.2.6 Addressing MOST Functions

In a MOST network, the devices are connected in a ring structure. To address these devices, different types of addresses can be used. The MOST Network Interface Controller provides six different types of addresses, which are introduced below.

2.1.2 Device Model

The following sections describe the logical model of a MOST device. A MOST device is a physical unit that can be connected to a MOST network via a MOST Network Interface Controller.

On the application level, a MOST device contains multiple components that are called function blocks (FBlocks), for example, tuner, amplifier, or CD player. It is possible that there are multiple FBlocks in a single MOST device, such as a tuner and an amplifier combined in one case and connected to the MOST network via a common MOST Network Interface Controller.

See Ex. 22, MOST Specification Rev. 3.0 E2 (07/2010) at pp. 39, 34

82. Upon information and belief, the Volvo Count I Automobiles include a central registry that stores the first addresses of the components.

MOST

3.1.3.3.2 Central Registry

The NetworkMaster generates the Central Registry during the initialization of the network and it continues to administrate it until Network Shutdown (section 3.1.2.3.2). The Central Registry is an image of the physical and logical system configuration. It contains the logical node address and the respective FBlocks of each device:

DeviceID	The DeviceID stands for a physical device or a group of devices in the network. The DeviceID (RxTxAdr) can represent a node position address (RxTxPos), a logical address (RxTxLog), or a group address.

RxTxLog	RxTxPos	FBlockID	InstID
0x0100	0	AudioDiskPlayer	1
		NetworkMaster	10
		ConnectionMaster	1
0x0101	1	AudioDiskPlayer	2
0x0102	2	AM/FMTuner	1
		AudioTapeRecorder	1
0x0103	3	AudioAmplifier	2
Etc.			
MaxNode	MaxNode	HumanMachineInterface	1

Table 3-10: Example of a Central Registry

See Ex. 22, MOST Specification Rev. 3.0 E2 (07/2010) at p. 140

83. Upon information and belief, the Volvo Count I Automobiles' Systems, or components therein communicate with other networks, such as cellular networks and Bluetooth

networks. For example, the Volvo Count I Automobiles include a Human Machine Interface module ("HMI") that is a component within the MOST network.

84. Upon information and belief, the HMI includes a Bluetooth component and can connect and/or pair to another Bluetooth device, such as a mobile phone.

85. Upon information and belief, the Volvo Count I Automobiles' System, or other components therein (such as the HMI) are assigned a second address by the other (second) network, e.g., Bluetooth network.

86. Accordingly, Volvo and/or the Volvo Count I Automobiles operating, for example, Telematics, Infotainment, and/or other systems within and external to the Volvo Count I Automobiles for, among other things, diagnostics directly infringe the methods covered by one or more claims of the '283 Patent.

87. Additionally, Volvo has been, and currently is, actively inducing infringement of the '283 Patent under 35 U.S.C. § 271(b) and contributorily infringing the '283 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

88. Volvo knew of the '283 Patent, or should have known of the '283 Patent, but was willfully blind to its existence. Volvo has had actual knowledge of the '283 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the '283 Patent.

89. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the '283 Patent with knowledge of the '283 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims

of the ’283 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing and promoting the described hardware and/or software components and features in the Volvo Count I Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the ’283 Patent. As an illustrative example only, Volvo induces such acts of infringement by providing its customers instructions on how to use its products and services in a manner or configuration that infringes one or more claims of the ’283 Patent.

90. Volvo has also committed, and continues to commit, contributory infringement, by *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the ’283 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the ’283 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

91. Volvo has actively induced, and continues to actively induce infringement of one or more claims of the ’283 Patent by intending that others use, offer for sale, or sell in the United States, products and/or method embodied therein as covered by one or more claims of the ’283 Patent, including but not limited to MOST networks implemented in, for example, the infotainment systems of the Volvo Count I Automobiles. Volvo provides these products and practices the methods embodied within the products covered by one or more claims of the ’283 Patent to others including customers, resellers, and end-user customers who in turn use, provide for use, offer for sale, or sell in the United States, the products and/or services and methods that directly infringe one or more claims of the ’283 Patent.

92. As a result of Volvo' acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT II
(Volvo's Infringement of U.S. Patent No. 7,891,004)

93. Paragraphs 1-92 are incorporated by reference as if fully set forth herein.

94. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the '004 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the '004 Patent including, but not limited to the C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge (collectively, "Volvo Count II Automobiles").

95. As an exemplary claim, Claim 68 of the '004 Patent is reproduced below:

68. A method for internetworking, comprising:

coupling, at a gateway node, a plurality of network elements in a motor vehicle, the motor vehicle comprising the gateway node, a first vehicle bus configured to carry communications according to a first communication protocol, a second vehicle bus configured to carry communications according to a second communication protocol, and the plurality of network elements, wherein the plurality of network elements includes a first set of network elements connected to the first vehicle bus, and a second set of network elements connected to the second vehicle bus;

automatically forming a network of the plurality of network elements in which the gateway node provides a bridge between the first vehicle bus and the

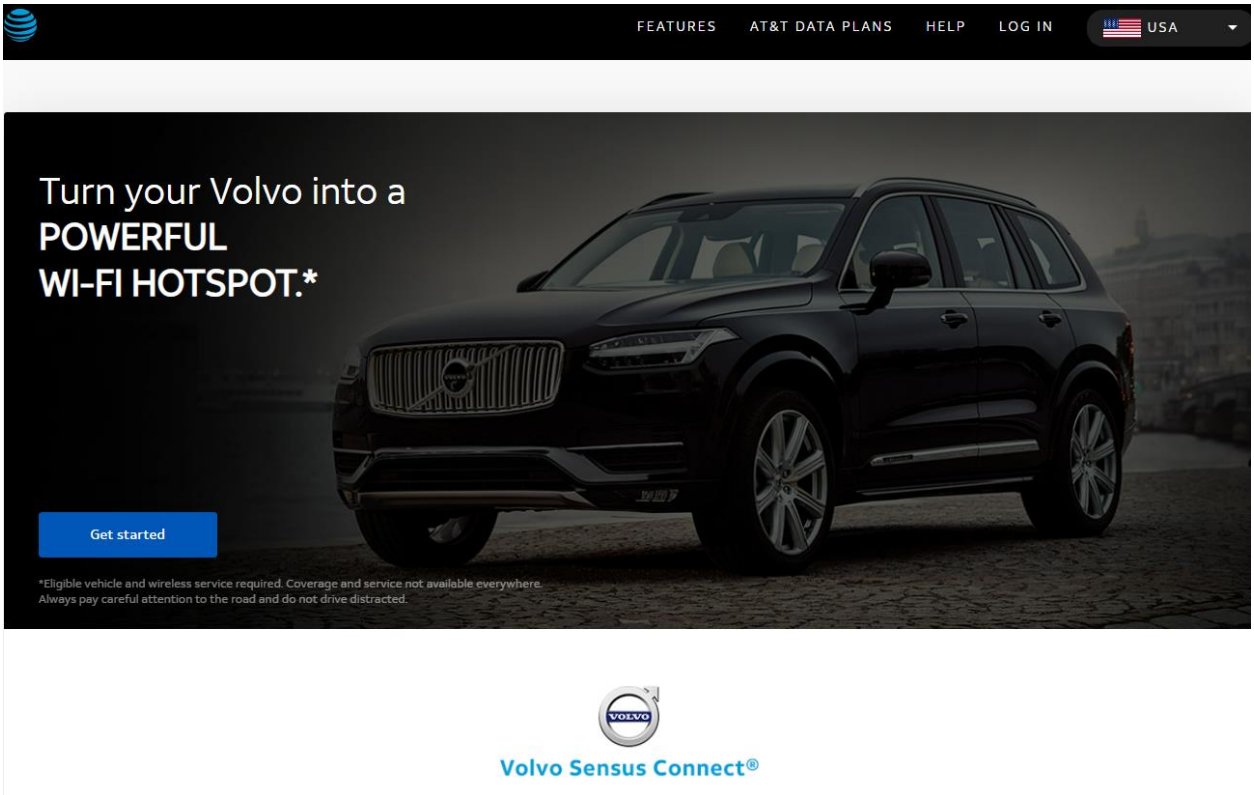
second vehicle bus, wherein the bridge is operable to pass messages between the first vehicle bus and the second vehicle bus;

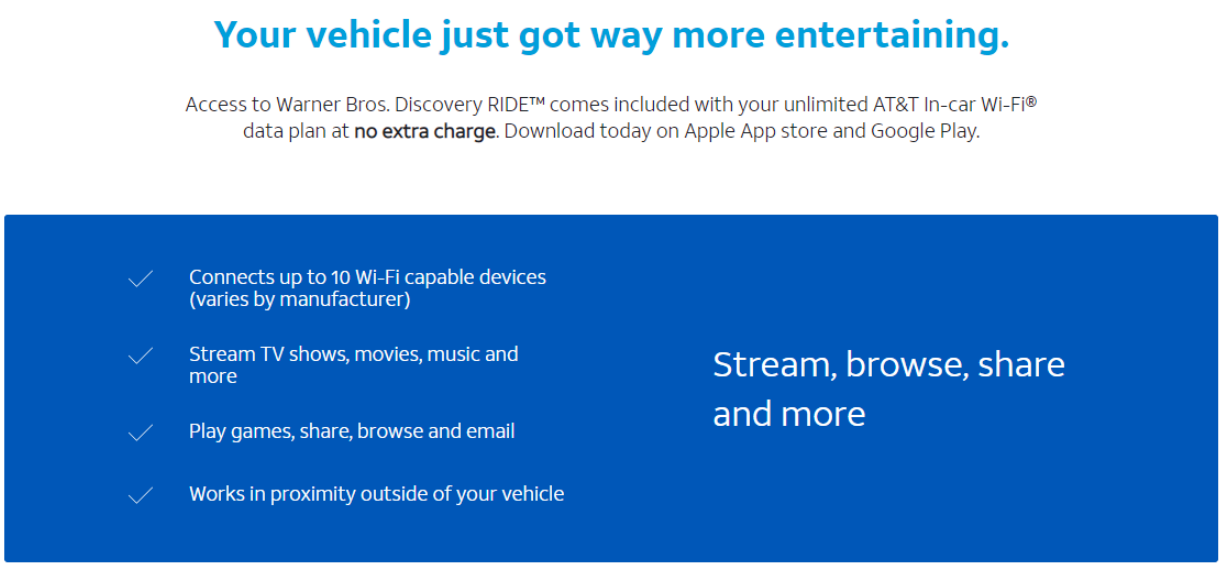
coupling at least one network element of the assembled plurality of network elements to a remote computer located outside of the motor vehicle; and

remotely controlling, at the remote computer, at least one function of the assembled plurality of network elements

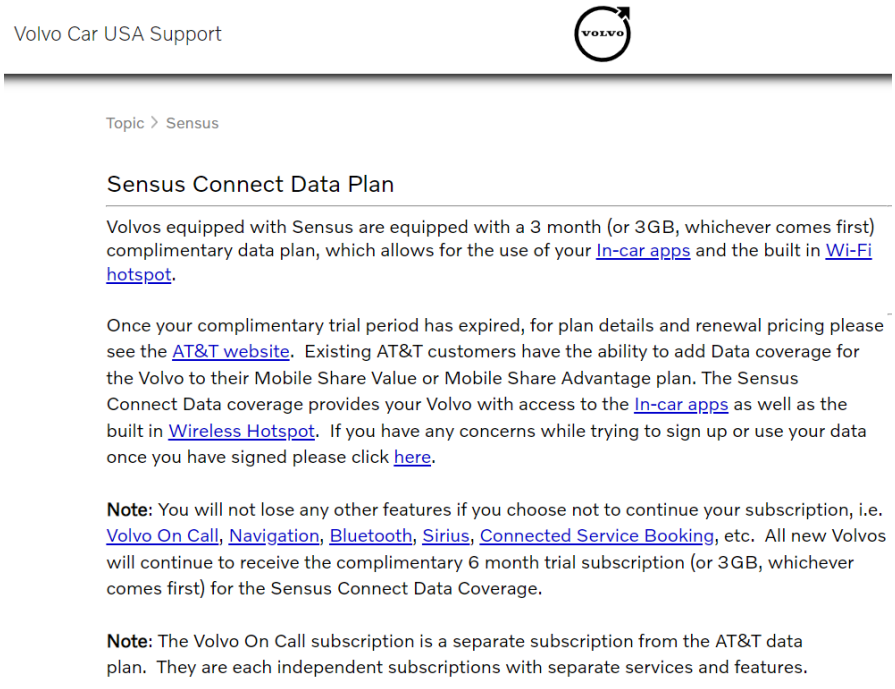
96. Upon information and belief, Volvo and the Volvo Count II Automobiles perform or can perform each and every limitation of at least claim 1 of the ’004 Patent.

97. Upon information and belief, the Volvo Count II Automobiles are equipped with systems, such as Volvo’s infotainment systems, Connected Services, and/or Volvo Sensus Connect, that use a method for internetworking:





Ex. 8, https://myvehicle.att.com/#/volvo/learn?language=en&country=US (last accessed on June 6, 2023).



Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

To check your data usage in your Volvo to determine the best plan coverage for your Volvo please follow the instructions below:

1. Press the MY CAR button twice
2. Select Internet settings
3. Select Car Modem and the Data usage will be displayed

Note: Please understand that certain activities will use up your data much faster than others; i.e. streaming audio and/or video (especially in higher quality) consumes more data than simply surfing the web while connected to the hotspot. Data usage varies by device. A device connected to the wi-fi hotspot in the vehicle will behave just like on an in-home wi-fi network; e.g. app updates or iTunes downloads that you have restricted from running on a cellular network, will resume when the device is connected to the hotspot.

Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

Sensus - connection and entertainment

Sensus makes it possible to use apps and turn your vehicle into a Wi-Fi hotspot.

This is Sensus

Sensus provides an intelligent interface and Internet connection to the digital world. An intuitive navigation structure offers access to relevant assistance, information and entertainment when it is needed, without distracting the driver.

Sensus includes all of the solutions in the vehicle related to entertainment, Internet connection and navigation*, and serves as the user interface between the driver and the vehicle. Sensus is what makes communication between you, the vehicle and the world around you possible.

Information when it's needed, where it's needed

The vehicle's displays present the right information at the right time. Information is presented in different displays depending on how it should be prioritized by the driver.

Ex. 23, Volvo XC90 Owner's Manual at p. 30 (available at https://volvornt.harte-hanks.com/manuals/2020/XC90_OwnersManual_MY20_en-US_TP29159[1].pdf (last accessed on June 7, 2023)).

98. Upon information and belief, Volvo and the Volvo Count II Automobiles use and/or include systems, such as Connected Services and Volvo Sensus Connect that employ coupling, at

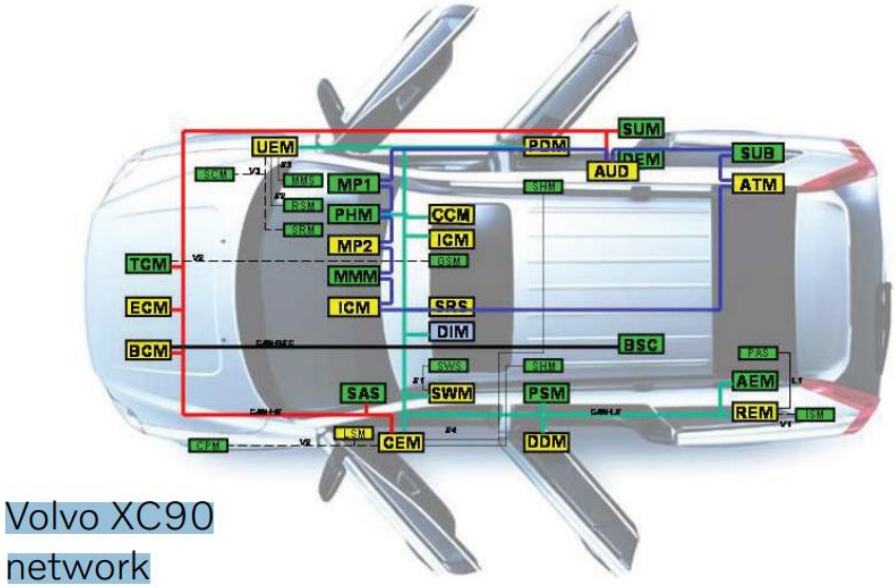
a gateway node, a plurality of network elements in a motor vehicle, the motor vehicle comprising the gateway node, a first vehicle bus configured to carry communications according to a first communication protocol, a second vehicle bus configured to carry communications according to a second communication protocol, and the plurality of network elements, wherein the plurality of network elements includes a first set of network elements connected to the first vehicle bus, and a second set of network elements connected to the second vehicle bus:

> Volvo's newest infotainment offering is called Sensus Connect. And with its large tablet-based control screen, it is one of the most advanced and most connected systems on the market today. Everything runs through the Sensus system and the driver can customize everything.

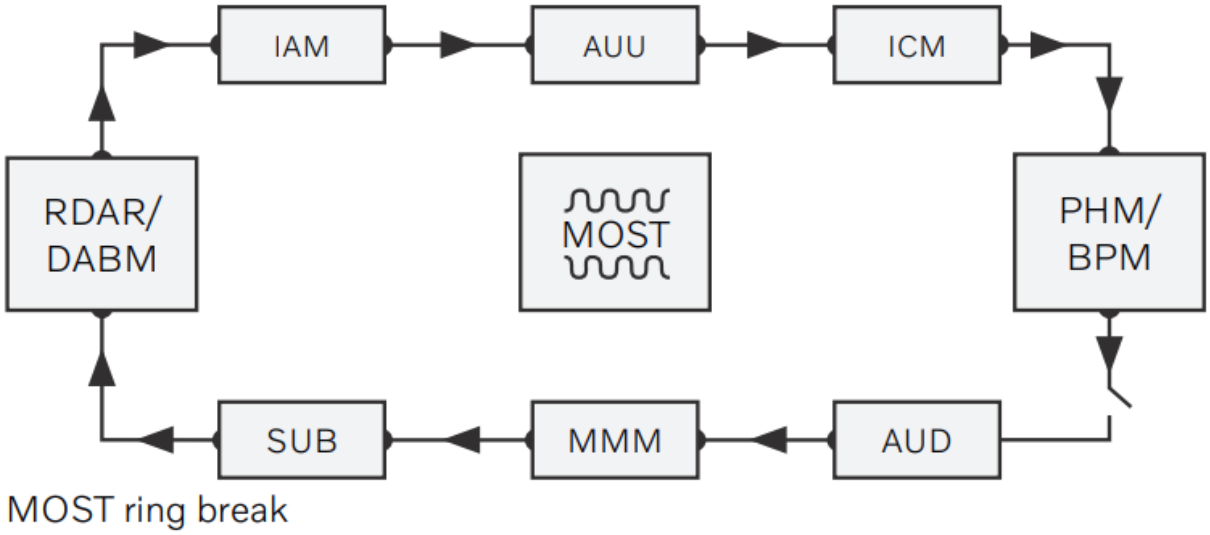
See Ex. 21 at p. 5, Volvo MOST Networks and Infotainment Systems Problems and Solutions (available at https://automotivetechinfo.com/wp-content/uploads/2021/05/Volvo-MOST-Networks-and-Infotainment-Systems-Problems-and-Solutions.pdf (last accessed on June 5, 2023)).

> **What does MOST mean?**
> MOST (Media Oriented Systems Transport) is a high-speed multimedia network technology optimized by the automotive industry. It can be used for applications inside or outside the vehicle.
>
> The serial MOST bus uses a daisy-chain topology or RING and Synchronous data communication to transport audio, video, voice, and data signals via plastic optic fiber (MOST25, MOST150) or electronic connectors (MOST50, MOST150) physical layers.
>
> MOST technology is used in almost every car brand worldwide, including Audi, BMW, GM, Honda, Hyundai, Jaguar, Lancia, Land Rover, Mercedes-Benz, Porsche, Toyota, VW, SAAB, Skoda, Seat and, of course, Volvo.

Id. at p. 7.



Id.



Id. at p. 10.

99. Upon information and belief, Volvo and the Volvo Count II Automobiles use and/or include systems, such as Connected Services and Volvo Sensus Connect, that automatically form a network of the plurality of network elements in which the gateway node provides a bridge

between the first vehicle bus and the second vehicle bus, wherein the bridge is operable to pass messages between the first vehicle bus and the second vehicle bus.

100. Upon information and belief, Volvo and the Volvo Count II Automobiles use and/or include systems, such as Connected Services and Volvo Sensus Connect, that couples at least one network element of the assembled plurality of network elements to a remote computer located outside of the motor vehicle.

101. Upon information and belief, the Volvo Count II Automobiles include a Telematics and Connectivity Antenna Module and/or Vehicle Connectivity Module that provides coupling to a remote computer.

102. Upon information and belief, Volvo and the Volvo Count II Automobiles use features, which provides a coupling to the Volvo Sensus Connect servers which are remote and located outside the motor vehicle. These features are thus used to remotely control, at the remote computer, at least one function of the assembled plurality of network elements.

103. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count II Automobiles equipped with features such as Connected Services and Volvo Sensus Connect as covered by one or more claims of the ’004 Patent.

104. Additionally, Volvo has been, and currently is, actively inducing infringement of the ’004 Patent under 35 U.S.C. § 271(b) and contributorily infringing the ’004 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

105. Volvo knew of the ’004 Patent, or should have known of the ’004 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the ’004 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would

infringe and actively induce and contribute to the infringement of one or more claims of the '004 Patent.

106. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the '004 Patent with knowledge of the '004 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the '004 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing, promoting, and instructing its customers on how to use the claimed Volvo Sensus Connect and/or Connected Services features in the Volvo Count II Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the '004 Patent.

107. Volvo has also committed, and continues to commit, contributory infringement, by *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the '004 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the '004 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

108. As a result of Volvo' acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT III

(Volvo' Infringement of U.S. Patent No. 9,232,158)

109. Paragraphs 1-108 are incorporated by reference as if fully set forth herein.

110. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the '158 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products

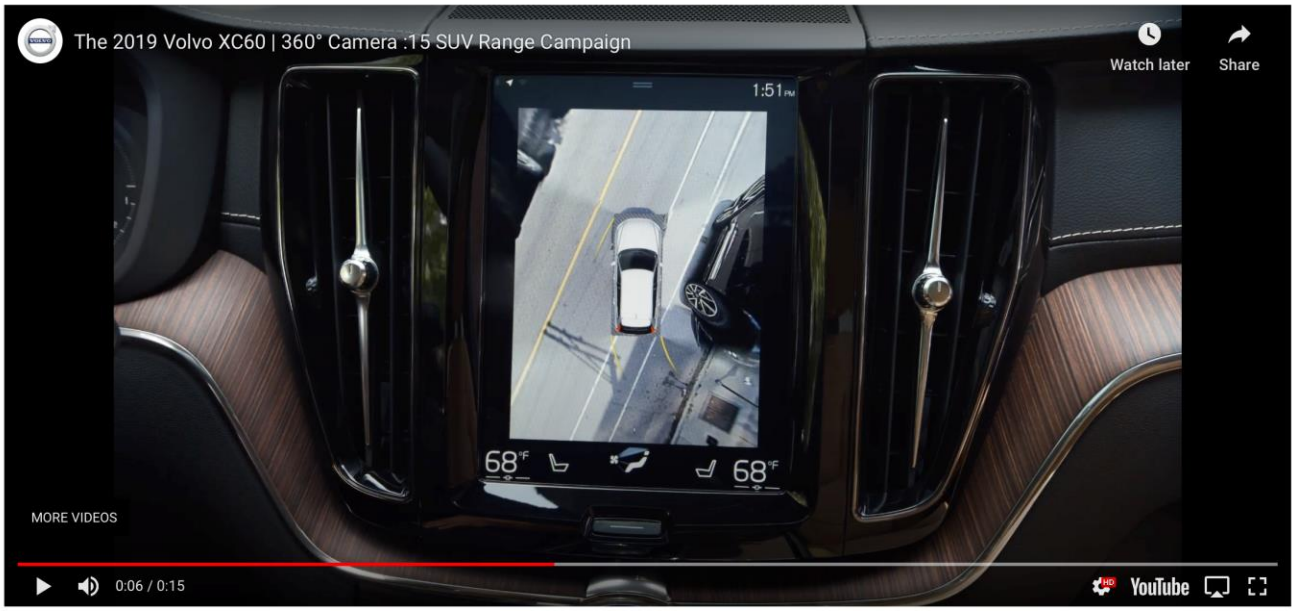
and/or services that infringe the ’158 Patent including, but not limited to C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge, and Volvo’s vehicle lines that are equipped with Surround View Camera (“Volvo Count III Automobiles”).

111. An exemplary claim, Claim 9 of the ’158 Patent is reproduced below:

> *9. A system comprising:*
>
> *a plurality of channels, wherein each channel of the plurality of channels includes a sensor; and*
>
> *a processing component coupled to the plurality of channels, wherein the processing component is configured to determine an integration time of each channel of the plurality of channels, wherein the processing component is configured to combine data from the plurality of channels received to provide an image...*

112. Upon information and belief, Volvo and the Volvo Count III Automobiles perform or can perform each and every limitation of at least claim 9 of the ’158 Patent.

113. Upon information and belief, the Volvo Count III Automobiles are equipped with a processing component that determines the integration time of multiple channels and combines the data from the multiple channels to provide an image as claimed in the ’158 Patent.



A Digital Birds-Eye View

The Volvo 360° Surround View Camera really is something incredible, offering what amounts to a birds-eye view of your Volvo. This stunning viusual is not taken from above, but is rather digitially stitched together thanks to a suite of fish-eye lens video cameras. Taking video inputs from the front grille, door mirrors, and rear tailgate, the 360° Surround View Camera system compiles them into a stunning overhead panorama. With this new technology **you can easily navigate into just about any parking space, precisely, quickly, and safely.**

Ex. 24, https://www.autonationvolvocarssanjose.com/research/360-surround-view-camera.htm (last accessed on June 5, 2023).

114. Upon information and belief, the Volvo 360° Surround View Camera ("Surround View") in the Volvo Count III VI Automobiles includes a plurality of channels, wherein each channel of the plurality of channels includes a sensor. Upon information and belief, Surround View uses four cameras (sensors) to create an overhead view of the area around the vehicle.

115. Upon information and belief, Surround View in the Volvo Count III Automobiles includes a processing component coupled to the plurality of channels, wherein the processing component is configured to determine an integration time of each channel of the plurality of channels, wherein the processing component is configured to combine data from the plurality of channels received to provide an image. Surround View includes hardware and software that stitches together the images from the four cameras to create a combined image displaying a bird's eye view of the vehicle.

What Is Volvo 360° Surround View Camera?

The 360° Surround View Camera is a an advanced parking aid designed give drivers a digital birds-eye view of their Volvo. Using high-resolution cameras mounted along the vehicle's perimiter, **the 360° Surround View Camera system makes parking a new Volvo car or SUV easier than ever before.**

Each and every new car sold today features a backup camera as standard. This has unboubtedly made a huge reduction in parking collisions and accidents, but can only do so much. When limited to just a single rear angle, driver's can oftentimes miss hazards at the other ends of the vehicle, especially curbs. Thanks to the 360° Surround View Camera, however, Volvo drivers can park confidently, wherever they are.

A Digital Birds-Eye View

The Volvo 360° Surround View Camera really is something incredible, offering what amounts to a birds-eye view of your Volvo. This stunning viusual is not taken from above, but is rather digitially stitched together thanks to a suite of fish-eye lens video cameras. Taking video inputs from the front grille, door mirrors, and rear tailgate, the 360° Surround View Camera system compiles them into a stunning overhead panorama. With this new technology **you can easily navigate into just about any parking space, precisely, quickly, and safely.**

New Volvo Vehicles With 360° Surround View Camera

The 360° Surround View Camera is one of **most useful parking assistance systems on the market**, and really has to be experienced in person. For 2020, 360° Surround View Camera is available for all new Volvo cars and SUVs equipped with the Advanced Package. For more information about Volvo 360° Surround View Camera system, or how to activate and use it, call us at (408) 758-5501 to speak with one of our friendly and knowledgeable teammates. While you're here, be sure to check out more exciting Volvo features and browse our inventory of new Volvo models with the 360° Surround View Camera system.

Ex. 24, https://www.autonationvolvocarssanjose.com/research/360-surround-view-camera.htm (last accessed on June 5, 2023).

116. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count III Automobiles equipped with Surround View that directly infringes one or more claims of the ’158 Patent.

117. Additionally, Volvo has been, and currently is, actively inducing infringement of the ’158 Patent under 35 U.S.C. § 271(b) and contributorily infringing the ’158 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

118. Volvo knew of the ’158 Patent, or should have known of the ’158 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the ’158 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the ’158 Patent.

119. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the ’158 Patent with knowledge of the ’158 Patent and

knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the '158 Patent. As an illustrative example only, Volvo induces such acts of infringement by their affirmative action of providing, promoting, and instructing its customers on how to use Surround View in the Volvo Count III Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the '158 Patent.

120. Volvo has also committed, and continues to commit, contributory infringement by, *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the '158 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the '158 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

121. As a result of Volvo' acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT IV
(Volvo's Infringement of U.S. Patent No. 10,292,138)

122. Paragraphs 1-121 are incorporated by reference as if fully set forth herein.

123. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the '138 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the '138 Patent including, but not limited to C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge that use in-Vehicle Wi-Fi or other vehicle Wi-Fi service (collectively, "Volvo Count IV Automobiles").

124. An exemplary claim, Claim 1 of the '138 Patent is reproduced below:

1. A user equipment (UE) comprising:

a processor communicatively coupled to a transmitter and circuitry configured to receive; and

the processor is configured to:

cause the circuitry to receive parameters associated with a plurality of radio bearers,

determine a plurality of buffer occupancies, wherein each of the plurality of buffer occupancies is associated with one or more radio bearers of the plurality of radio bearers,

cause the transmitter to transmit a message including the plurality of buffer occupancies to a network,

cause the circuitry to receive a single allocation of uplink resources,

select data from the plurality of radio bearers for transmission using the single allocation of uplink resources, wherein the selection of the data occurs using a first iteration and a second iteration,

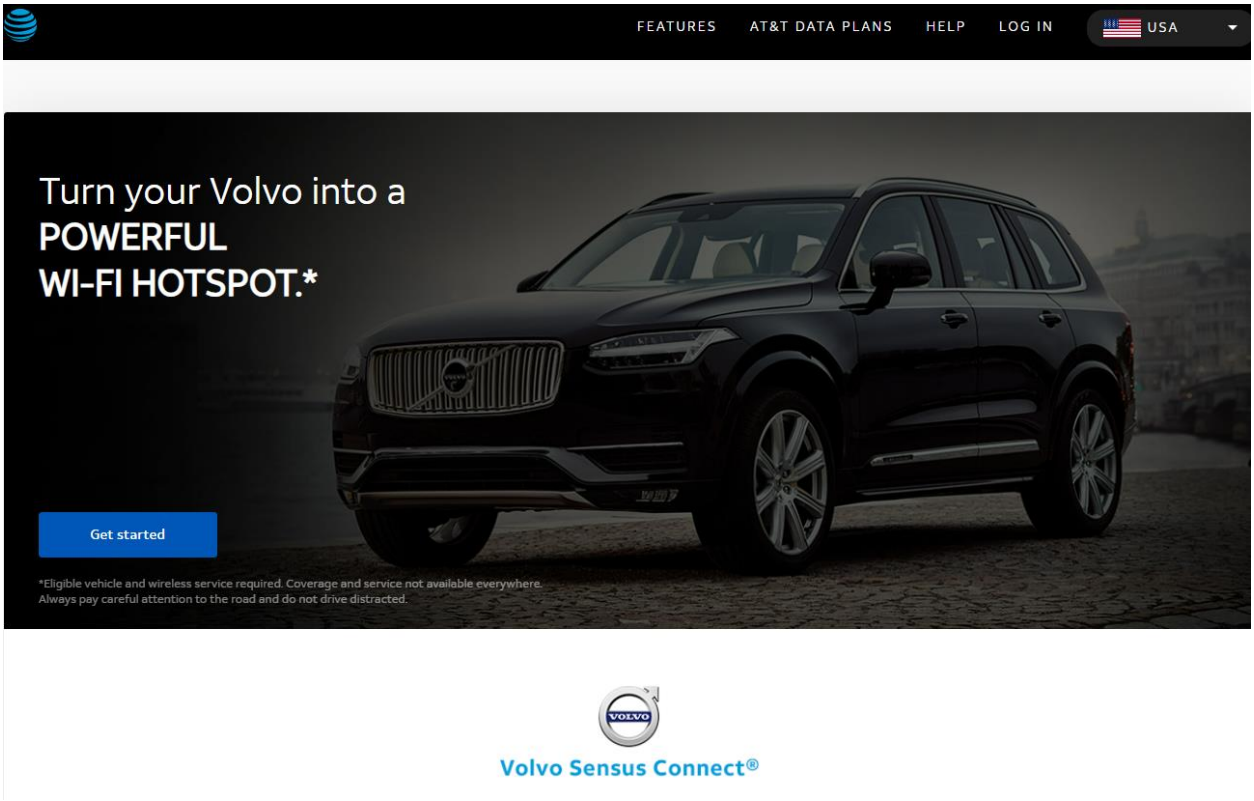
wherein in the first iteration, the selection of the data is selected from a subset of the plurality of radio bearers based on the received parameters,

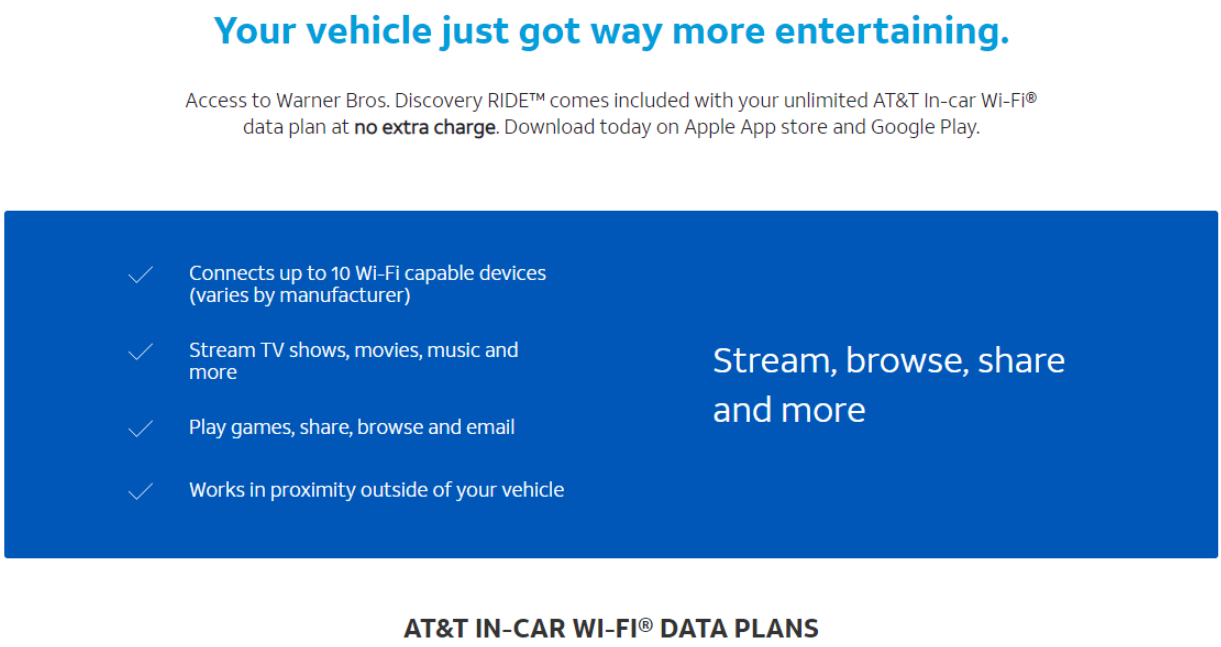
wherein in the second iteration, the selection of the data is based on buffered data for respective radio bearers, and cause the transmitter to transmit a signal including the selected data.

125. Upon information and belief, the Volvo Count IV Automobiles perform each and every limitation of at least claim 1 of the ’138 Patent.

126. Upon information and belief, the Volvo Count IV Automobiles include Volvo Mobile Hotspot System. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot System can connect with 4G LTE to the Internet.

127. Upon information and belief, the Volvo Count IV Automobiles are equipped with mobile wireless hot-spot systems as claimed in the '138 Patent. Upon information and belief, Internet connectivity for the Mobile Hot-Spot is provided by AT&T, Verizon Wireless and/or another Internet provider through, for example, a trial period and/or through a subscription.





Ex. 8, https://myvehicle.att.com/#/volvo/learn?language=en&country=US (last accessed on June 6, 2023).

128. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot, and/or 4G LTE modem are compliant with and use the 3GPP standards.

129. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor communicatively coupled to a transmitter and circuitry configured to receive. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor which is communicatively coupled to a transmitter and circuitry configured to receive.

3.2 Abbreviations

UE User Equipment

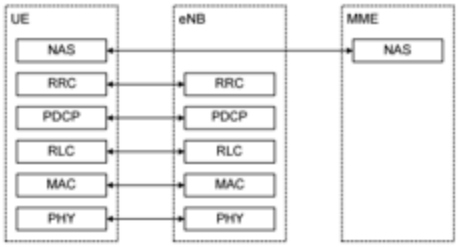


Figure 4.3.2-1: Control-plane protocol stack

7.2 RRC protocol states & state transitions

- At PDCP/RLC/MAC level:
  - UE can transmit and/or receive data to/from network;
  - UE monitors control signalling channel for shared data channel to see if any transmission over the shared data channel has been allocated to the UE;

See Ex. 25, 3GPP TS 36.300 V8.12.0 at pp. 12, 15, 19, 37, 38.

130. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor further configured to cause the circuitry to receive parameters associated with a plurality of radio bearers.

4.3.2 Control plane

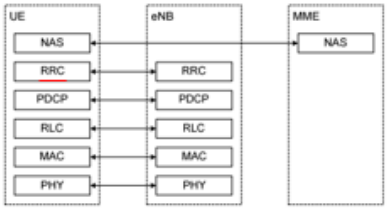


Figure 4.3.2-1: Control-plane protocol stack

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 19.

5.4.3 Multiplexing and assembly

5.4.3.1 Logical channel prioritization

The Logical Channel Prioritization procedure is applied when a new transmission is performed.

RRC controls the scheduling of uplink data by signalling for each logical channel: *priority* where an increasing *priority* value indicates a lower priority level, *prioritisedBitRate* which sets the Prioritized Bit Rate (PBR), *bucketSizeDuration* which sets the Bucket Size Duration (BSD).

See Ex. 26, 3GPP TS 36.321 V8.12.0 at p. 24.

6.3.2 Radio resource control information elements

***LogicalChannelConfig* information element**

```
-- ASN1START

LogicalChannelConfig ::=            SEQUENCE {
    ul-SpecificParameters               SEQUENCE {
        priority                            INTEGER (1..16),
        prioritisedBitRate                  ENUMERATED {
                                                kBps0, kBps8, kBps16, kBps32, kBps64, kBps128,
                                                kBps256, infinity, spare8, spare7, spare6,
                                                spare5, spare4, spare3, spare2, spare1},
        bucketSizeDuration                  ENUMERATED {
                                                ms50, ms100, ms150, ms300, ms500, ms1000, spare2,
                                                spare1},
```

See Ex. 27, 3GPP TS 36.331 V8.21.0 at pp. 116, 118.

131. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor configured to further determine a plurality of buffer occupancies, wherein each of the plurality of buffer occupancies is associated with one or more radio bearers of the plurality of radio bearers.

5.4.5 Buffer Status Reporting

The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers *periodicBSR-Timer* and *retxBSR-Timer* and by, for each logical channel, optionally signalling *logicalChannelGroup* which allocates the logical channel to an LCG [8].

For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended.

See Ex. 26, 3GPP TS 36.321 V8.12.0 at Sec. 5.4.5 at p. 25.

6 Layer 2

- The multiplexing of several logical channels (i.e. radio bearers) on the same transport channel (i.e. transport block) is performed by the MAC sublayer;

See Ex. 25, 3GPP TS 36.300 V8.12.0 at Fig. 6-2 at pp. 31, 32.

132. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot, and/or 4G LTE modem comprise a processor configured to further cause the transmitter to transmit a message including the plurality of buffer occupancies to a network.

4.3.2 Control plane

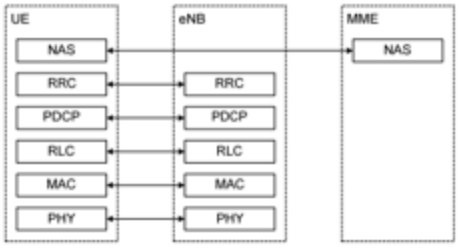


Figure 4.3.2-1: Control-plane protocol stack

See Ex. 25, 3GPP TS 36.300 V8.12.0 at pp. 18, 19.

5.4.5 Buffer Status Reporting

The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers *periodicBSR-Timer* and *retxBSR-Timer* and by, for each logical channel, optionally signalling *logicalChannelGroup* which allocates the logical channel to an LCG [8].

For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended.

A Buffer Status Report (BSR) shall be triggered if any of the following events occur:

See Ex. 26, 3GPP TS 36.321 V8.12.0 at p. 25.

133. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor configured to further cause the circuitry to receive a single allocation of uplink resources.

11.1 Basic Scheduler Operation

MAC in eNB includes dynamic resource schedulers that allocate physical layer resources for the DL-SCH and UL-SCH transport channels. Different schedulers operate for the DL-SCH and UL-SCH.

11.1.2 Uplink Scheduling

In the uplink, E-UTRAN can dynamically allocate resources (PRBs and MCS) to UEs at each TTI via the C-RNTI on PDCCH(s). A UE always monitors the PDCCH(s) in order to find possible allocation for uplink transmission when its downlink reception is enabled (activity governed by DRX when configured). When CA is configured, the same C-RNTI applies to all serving cells.

Physical downlink control channel (PDCCH)

- Informs the UE about the resource allocation of PCH and DL-SCH, and Hybrid ARQ information related to DL-SCH;
- Carries the uplink scheduling grant.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at pp. 67, 24.

134. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor configured to further select data from the plurality of radio bearers for transmission using the single allocation of uplink resources. Upon information

and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor that selects the data for transmission and allocates resources for each logical channel (i.e. radio bearer) for transmission on the allocated uplink resources. Upon information and belief, in the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem, the selection of the data occurs using a first iteration and a second iteration. Upon information and belief, in the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem, in the first iteration, the selection of the data is selected from a subset of the plurality of radio bearers based on the received parameters. Upon information and belief, in the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem, in the second iteration, the selection of the data is based on buffered data for respective radio bearers.

4.2.1 MAC Entities

E-UTRA defines two MAC entities; one in the UE and one in the E-UTRAN. These MAC entities handle the following transport channels:

- Uplink Shared Channel (UL-SCH);
- Random Access Channel(s) (RACH).

See Ex. 26, 3GPP TS 36.321 V8.12.0 at p. 8.

5.4.3.1 Logical channel prioritization

The Logical Channel Prioritization procedure is applied when a new transmission is performed.

RRC controls the scheduling of uplink data by signalling for each logical channel: *priority* where an increasing *priority* value indicates a lower priority level, *prioritisedBitRate* which sets the Prioritized Bit Rate (PBR), *bucketSizeDuration* which sets the Bucket Size Duration (BSD).

The UE shall maintain a variable Bj for each logical channel j. Bj shall be initialized to zero when the related logical channel is established, and incremented by the product PBR × TTI duration for each TTI, where PBR is Prioritized Bit Rate of logical channel j. However, the value of Bj can never exceed the bucket size and if the value of Bj is larger than the bucket size of logical channel j, it shall be set to the bucket size. The bucket size of a logical channel is equal to PBR × BSD, where PBR and BSD are configured by upper layers.

The UE shall perform the following Logical Channel Prioritization procedure when a new transmission is performed:

- The UE shall allocate resources to the logical channels in the following steps:
  - Step 1: All the logical channels with Bj > 0 are allocated resources in a decreasing priority order. If the PBR of a radio bearer is set to "infinity", the UE shall allocate resources for all the data that is available for transmission on the radio bearer before meeting the PBR of the lower priority radio bearer(s);
  - Step 2: the UE shall decrement Bj by the total size of MAC SDUs served to logical channel j in Step 1

NOTE: The value of Bj can be negative.

- Step 3: if any resources remain, all the logical channels are served in a strict decreasing priority order (regardless of the value of Bj) until either the data for that logical channel or the UL grant is exhausted, whichever comes first. Logical channels configured with equal priority should be served equally.

See Ex. 26, 3GPP TS 36.321 V8.12.0 at p. 24.

135. Upon information and belief, the Volvo Count IV Automobiles' Mobile Hotspot and/or 4G LTE modem comprise a processor configured to further cause the transmitter to transmit a signal including the selected data.

13.1 Bearer service architecture

- A data radio bearer transports the packets of an EPS bearer between a UE and an eNB. When a data radio bearer exists, there is a one-to-one mapping between this data radio bearer and the EPS bearer/E-RAB.

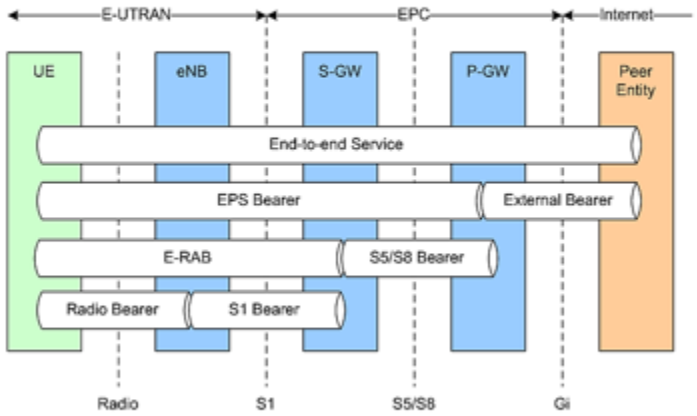


Figure 13.1-1: EPS Bearer Service Architecture

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 71.

136. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count IV Automobiles equipped with a Mobile Hotspot System and/or 4G LTE modem that directly infringe one or more claims of the '138 Patent.

137. Additionally, Volvo has been, and currently is, actively inducing infringement of the '138 Patent under 35 U.S.C. § 271(b) and contributorily infringing the '138 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

138. Volvo knew of the '138 Patent, or should have known of the '138 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the '138 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would

infringe and actively induce and contribute to the infringement of one or more claims of the ’138 Patent.

139. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the ’138 Patent with knowledge of the ’138 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the ’138 Patent. As an illustrative example only, Volvo induces such acts of infringement by their affirmative action of providing, promoting, and instructing its customers on how to use Volvo’s Mobile Hotspot systems and connectivity features in the Volvo Count VIII Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the ’138 Patent.

140. Volvo has also committed, and continues to commit, contributory infringement, by *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the ’138 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the ’138 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

141. As a result of Volvo’s acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT V

(Volvo’s Infringement of U.S. Patent No. 8,953,641)

142. Paragraphs 1-141 are incorporated by reference as if fully set forth herein.

143. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the ’641 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products

and/or services that infringe the ’641 Patent including, but not limited to C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge that use in-Vehicle Wi-Fi or other vehicle Wi-Fi service (collectively, “Volvo Count V Automobiles”).

144. As an exemplary claim, Claim 11 of the ’641 Patent, is reproduced below:

11. A mobile station, comprising:

circuitry configured to receive broadcast information to access an orthogonal frequency division multiple access (OFDMA) system, wherein the broadcast information is received only in a first band having a first bandwidth and the broadcast information is carried by a plurality of groups of subcarriers with each group having a plurality of contiguous subcarriers; and

circuitry configured to determine a second bandwidth of a second band that is associated with the OFDMA system based upon the broadcast information received in the first band, wherein a second bandwidth of the second band is greater than the first bandwidth of the first band,

wherein the first band is contained within the second band,

wherein a data channel is carried by at least one subcarrier group of the second band,

wherein the plurality of contiguous subcarriers have fixed spacing,

wherein a number of usable subcarriers is adjustable to realize a variable band, wherein the number of usable subcarriers is determined based on a plurality of operating channel bandwidths, and

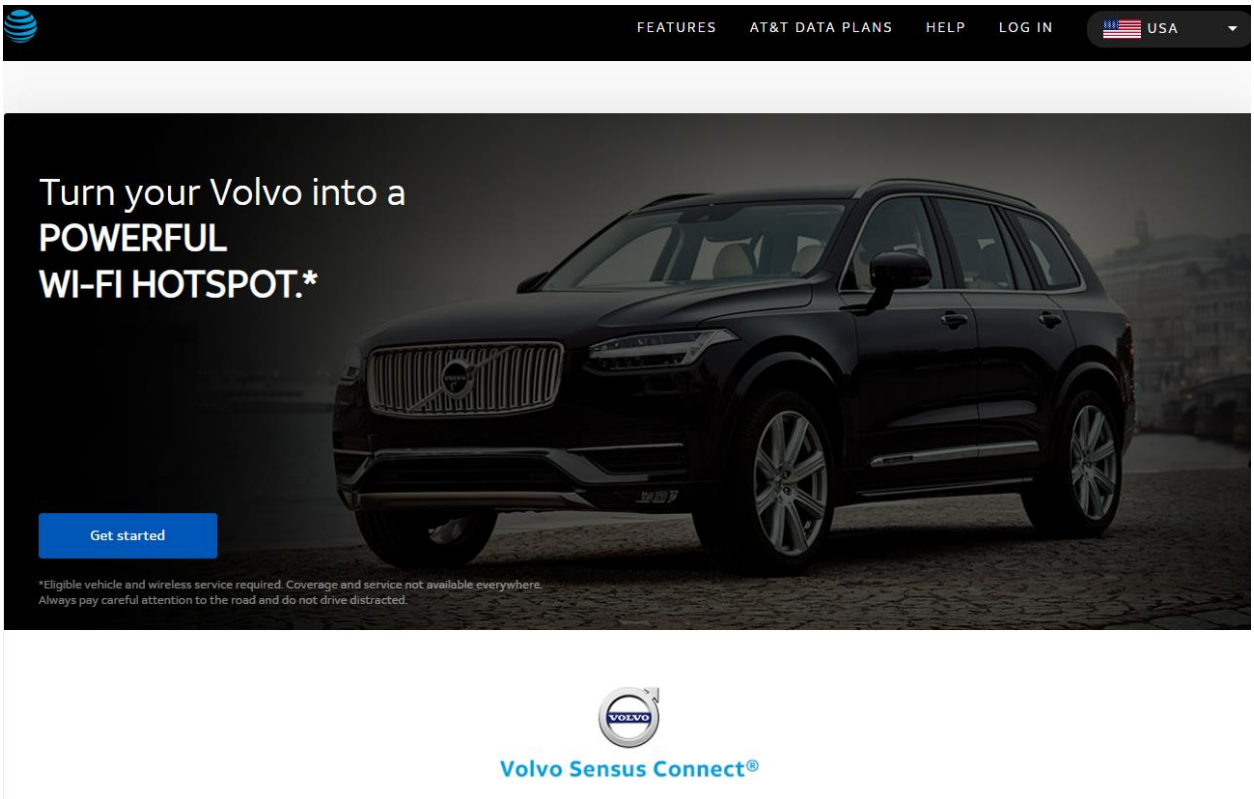
wherein the first band is defined as a frequency segment with a bandwidth that is not greater than a smallest operating channel bandwidth among the plurality

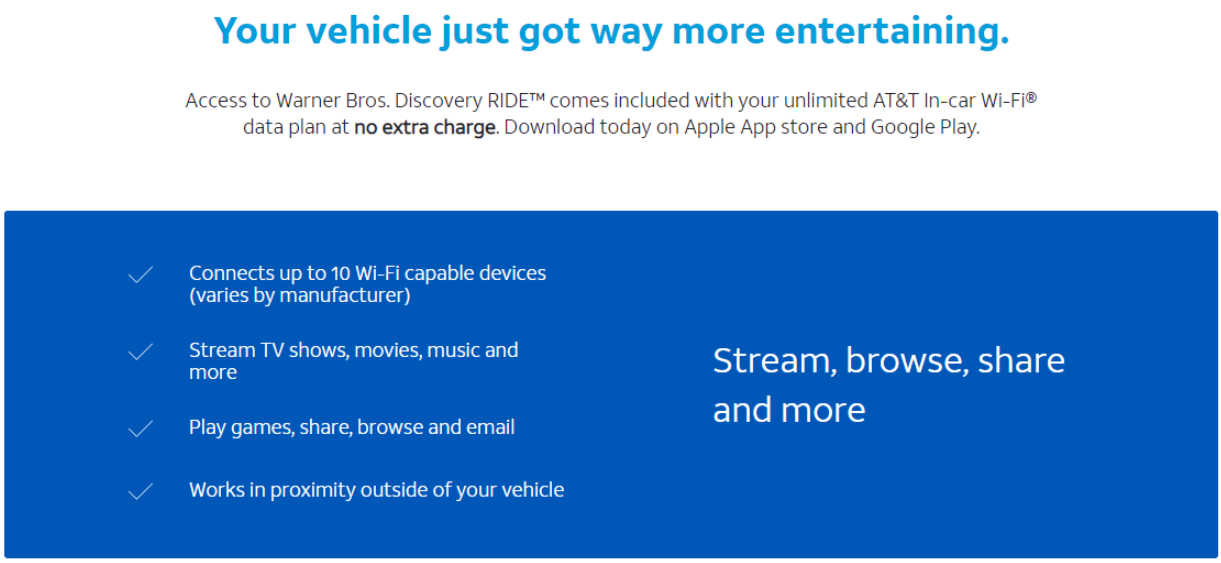
of operating channel bandwidths, the first band having a same value for the plurality of operating channel bandwidths wherein the mobile station is configured to operate within the plurality of operating channel bandwidths.

145. Upon information and belief, the Volvo Count V Automobiles perform each and every limitation of at least claim 1 of the ’641 Patent.

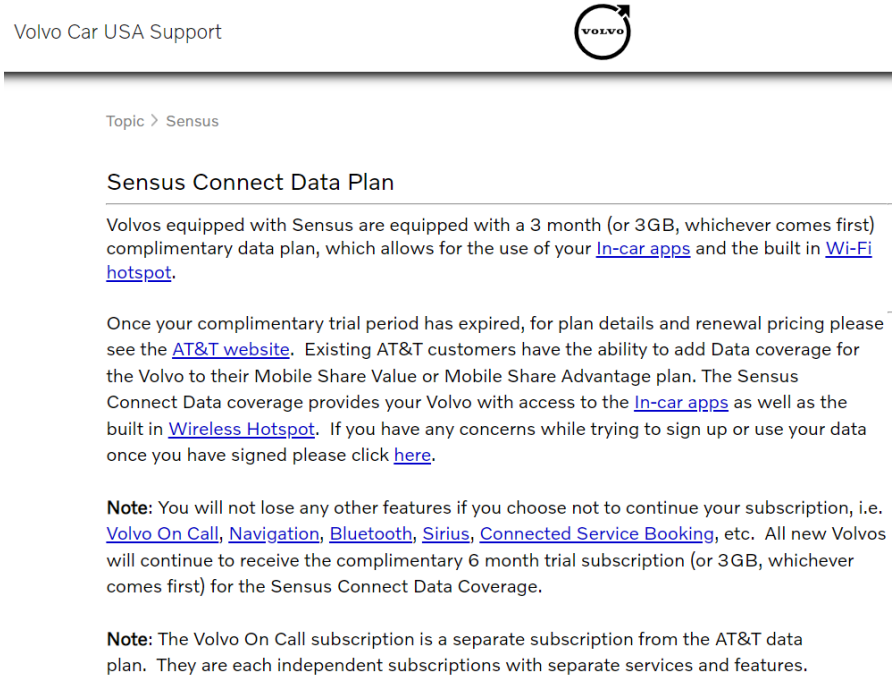
146. Upon information and belief, the Volvo Count V Automobiles include Volvo Mobile Hotspot System. Upon information and belief, the Volvo Count V Automobiles’ Mobile Hotspot System can connect with 4G LTE to the Internet.

147. Upon information and belief, the Volvo Count V Automobiles are equipped with mobile wireless hot-spot systems as claimed in the ’641 Patent. Upon information and belief, Internet connectivity for the Mobile Hot-Spot is provided by AT&T, Verizon Wireless and/or another Internet provider through, for example, a trial period and/or through a subscription.





Ex. 8, https://myvehicle.att.com/#/volvo/learn?language=en&country=US (last accessed on June 6, 2023).



Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

148. Upon information and belief, the Volvo Count V Automobiles' Mobile Hotspot and/or 4G LTE modem are compliant with and use the 3GPP standards.

149. Upon information and belief, the Volvo Count V Automobiles include circuitry configured to receive broadcast information to access an orthogonal frequency division multiple access (OFDMA) system.[12]

4.3.2 Control plane

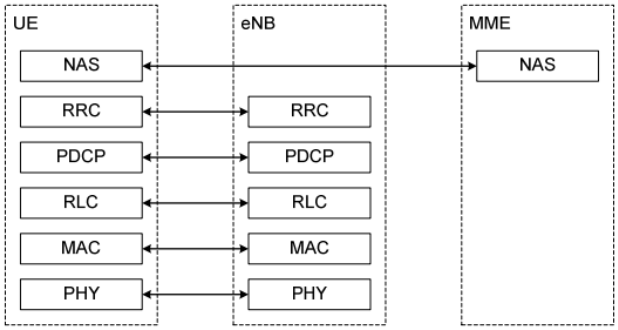


Figure 4.3.2-1: Control-plane protocol stack

4 Overall architecture

The E-UTRAN consists of eNBs, providing the E-UTRA user plane (PDCP/RLC/MAC/PHY) and control plane (RRC) protocol terminations towards the UE. The eNBs are interconnected with each other by means of the X2 interface. The eNBs are also connected by means of the S1 interface to the EPC (Evolved Packet Core), more specifically to the MME (Mobility Management Entity) by means of the S1-MME and to the Serving Gateway (S-GW) by means of the S1-U. The S1 interface supports a many-to-many relation between MMEs / Serving Gateways and eNBs.

4.3.2 Control plane

- RRC (terminated in eNB on the network side) performs the functions listed in subclause 7, e.g.:
  - Broadcast;

5.1 Downlink Transmission Scheme

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$.

See Ex. 25, 3GPP TS 36.300 at pp. 18, 19, 15, 25.

150. Upon information and belief, broadcast information is received only in a first band having a first bandwidth.[13]

[12] *See* Ex. 25, 3GPP TS 36.300 at pp. 18, 19, 15, 25.
[13] *See* Ex. 28, 3GPP TS 36.211 V8.9.0 at Sec. 6.6.4, pp. 56, 57, 58.

6.6 Physical broadcast channel

6.6.4 Mapping to resource elements

The block of complex-valued symbols $y^{(p)}(0),\ldots,y^{(p)}(M_{\text{symb}}-1)$ for each antenna port is transmitted during 4 consecutive radio frames starting in each radio frame fulfilling $n_f \bmod 4 = 0$ and shall be mapped in sequence starting with $y(0)$ to resource elements (k,l). The mapping to resource elements (k,l) not reserved for transmission of reference signals shall be in increasing order of first the index k, then the index l in slot 1 in subframe 0 and finally the radio frame number. The resource-element indices are given by

$$k = \frac{N_{\text{RB}}^{\text{DL}} N_{\text{sc}}^{\text{RB}}}{2} - 36 + k', \qquad k' = 0,1,\ldots,71$$
$$l = 0,1,\ldots,3$$

where resource elements reserved for reference signals shall be excluded. The mapping operation shall assume cell-specific reference signals for antenna ports 0-3 being present irrespective of the actual configuration. The UE shall assume that the resource elements assumed to be reserved for reference signals in the mapping operation above but not used for transmission of reference signal are not available for PDSCH transmission. The UE shall not make any other assumptions about these resource elements.

See Ex. 28, 3GPP TS 36.211 V8.9.0 at Sec. 6.6.4, pp. 56, 57.

151. Upon information and belief, broadcast information is received only in a first band having a first bandwidth and the broadcast information is carried by a plurality of groups of subcarriers with each group having a plurality of contiguous subcarriers.[14]

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25.

152. Upon information and belief, the Volvo Count V Automobiles include circuitry configured to determine a second bandwidth of a second band that is associated with the OFDMA system based upon the broadcast information received in the first band.[15]

Physical broadcast channel (PBCH)

- The coded BCH transport block is mapped to four subframes within a 40 ms interval;
- 40 ms timing is blindly detected, i.e. there is no explicit signalling indicating 40 ms timing;
- Each subframe is assumed to be self-decodable, i.e. the BCH can be decoded from a single reception, assuming sufficiently good channel conditions.

[14] *See* Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25; Ex. 27, 3GPP TS 36.331 V8.21.0 at p. 21.
[15] *See* Ex. 27, 3GPP TS 36.331 V8.21.0 at pp. 21, 85, 86.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 24.

153. Upon information and belief, the second bandwidth of the second band is greater than the first bandwidth of the first band.

Table 5.6-1 Transmission bandwidth configuration N_{RB} in E-UTRA channel bandwidths

Channel bandwidth $BW_{Channel}$ [MHz]	1.4	3	5	10	15	20
Transmission bandwidth configuration N_{RB}	6	15	25	50	75	100

See Ex. 29, 3GPP TS 36.104 V8.14.1 at p. 14.

154. Upon information and belief, the Volvo Count V Automobiles include a mobile station wherein the first band is contained within the second band and wherein a data channel is carried by at least one subcarrier group of the second band.

155. Upon information and belief, the Volvo Count V Automobiles include a mobile station wherein the plurality of contiguous subcarriers have fixed spacing.[16]

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25.

156. Upon information and belief, the Volvo Count V Automobiles include a mobile station wherein a number of usable subcarriers is adjustable to realize a variable band, wherein the number of usable subcarriers is determined based on a plurality of operating channel bandwidths.[17]

5.1.1 Basic transmission scheme based on OFDM

The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is $\Delta f = 15$ kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$.

[16] *See* Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25.
[17] Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25; Ex. 29, 3GPP TS 36.104 V8.14.1 at p. 14; Ex. 27, 3GPP TS 36.331 V8.21.0 at pp. 85-86.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 25.

157. Upon information and belief, the Volvo Count V Automobiles include a mobile station wherein the first band is defined as a frequency segment with a bandwidth that is not greater than a smallest operating channel bandwidth among the plurality of operating channel bandwidths, the first band having a same value for the plurality of operating channel bandwidths.[18]

LTE bandwidth	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz
PBCH Resource Elements per radio Frame	240	240	240	240	240	240
Overhead(normal CP)	240/ 10080 = 2.4%	240/ 25200 = 1.0%	240/ 42000 = 0.6%	240/ 84000 = 0.3%	240/ 126000 = 0.2%	240/ 168000 = 0.1%
Overhead(extended CP)	240/ 8640 = 2.8%	240/ 21600 = 1.1%	240/ 36000 = 0.7%	240/ 72000= 0.3%	240/ 108000 = 0.2%	240/ 144000 = 0.2%

158. Upon information and belief, the Volvo Count V Automobiles include a mobile station configured to operate within the plurality of operating channel bandwidths.[19]

Physical broadcast channel (PBCH)

- The coded BCH transport block is mapped to four subframes within a 40 ms interval;
- 40 ms timing is blindly detected, i.e. there is no explicit signalling indicating 40 ms timing;
- Each subframe is assumed to be self-decodable, i.e. the BCH can be decoded from a single reception, assuming sufficiently good channel conditions.

See Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 24.

[18] Ex. 29, 3GPP TS 36.104 V8.14.1 at p. 14; Ex. 30, http://www.rfwireless-world.com/Terminology/LTE-PBCH-Physical-Broadcast-Channel.html (last accessed on June 6, 2023).
[19] Ex. 27, 3GPP TS 36.331 V8.21.0 at pp 85-86; Ex. 29, 3GPP TS 36.104 V8.14.1 at p. 14; Ex. 25, 3GPP TS 36.300 V8.12.0 at p. 24.

159. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count IX Automobiles equipped with a Mobile Hotspot System and/or 4G LTE modem that directly infringe one or more claims of the '641 Patent.

160. Additionally, Volvo has been, and currently is, actively inducing infringement of the '641 Patent under 35 U.S.C. § 271(b) and contributorily infringing the '641 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

161. Volvo knew of the '641 Patent, or should have known of the '641 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the '641 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the '641 Patent.

162. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the '641 Patent with knowledge of the '641 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the '641 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing, promoting, and instructing its customers on how to use Volvo Mobile Hotspot systems and connectivity features in the Volvo Count V Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the '641 Patent.

163. Volvo has also committed, and continues to commit, contributory infringement, by *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the '641 Patent by a third party, and which have no

substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the ’641 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

164. As a result of Volvo’s acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT VI

(Volvo’s Infringement of U.S. Patent No. 7,684,318)

165. Paragraphs 1-165 are reincorporated by reference as if fully set forth herein.

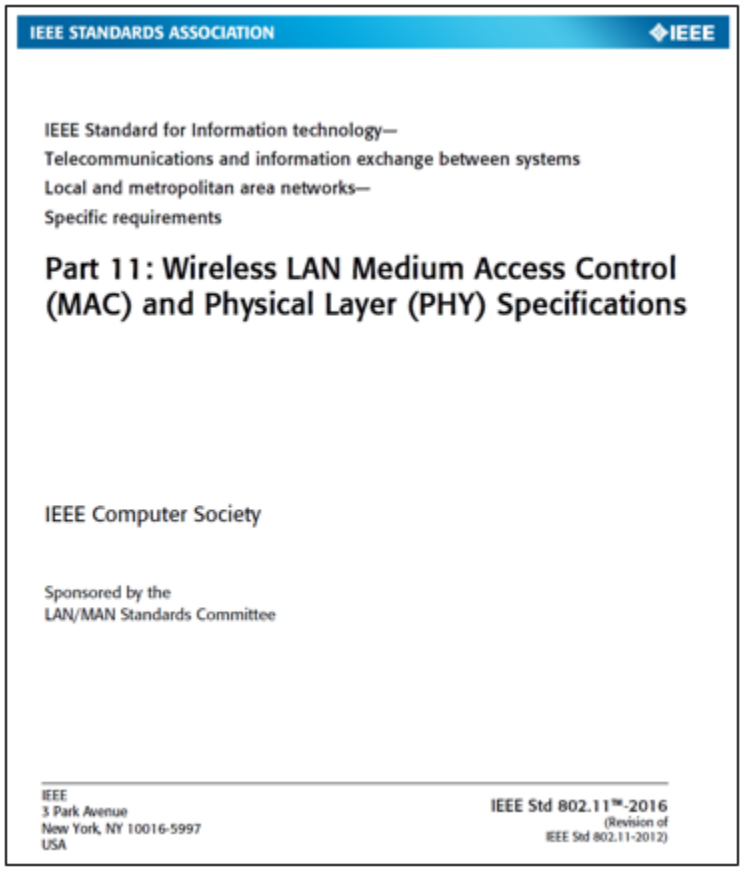
166. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the ’318 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the ’318 Patent including, but not limited to C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge that use in-Vehicle Wi-Fi or other vehicle Wi-Fi service (collectively, “Volvo Count VI Automobiles”).

167. An exemplary claim, Claim 1 of the ’318 Patent is reproduced below:

> *1. A method, comprising:*
>
> *queuing data frames to be transmitted during a transmitting station's transmit opportunity, wherein the data frames are queued in a queue, wherein the transmit opportunity corresponds to a length of time during which the transmitting station will transmit data frames from the queue to a shared-communications channel, and wherein the transmit opportunity is commenced with a control frame; and*
>
> *setting a length of time for the transmit opportunity based on a priority of the queue.*

168. Upon information and belief, Volvo and the Volvo Count VI Automobiles perform or can perform each and every limitation of at least claim 1 of the ’318 Patent.

169. Upon information and belief, Volvo Count VI Automobiles are equipped to provide wireless connectivity utilizing IEEE 802.11-2016.


IEEE STANDARDS ASSOCIATION IEEE

IEEE Standard for Information technology—
Telecommunications and information exchange between systems
Local and metropolitan area networks—
Specific requirements

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

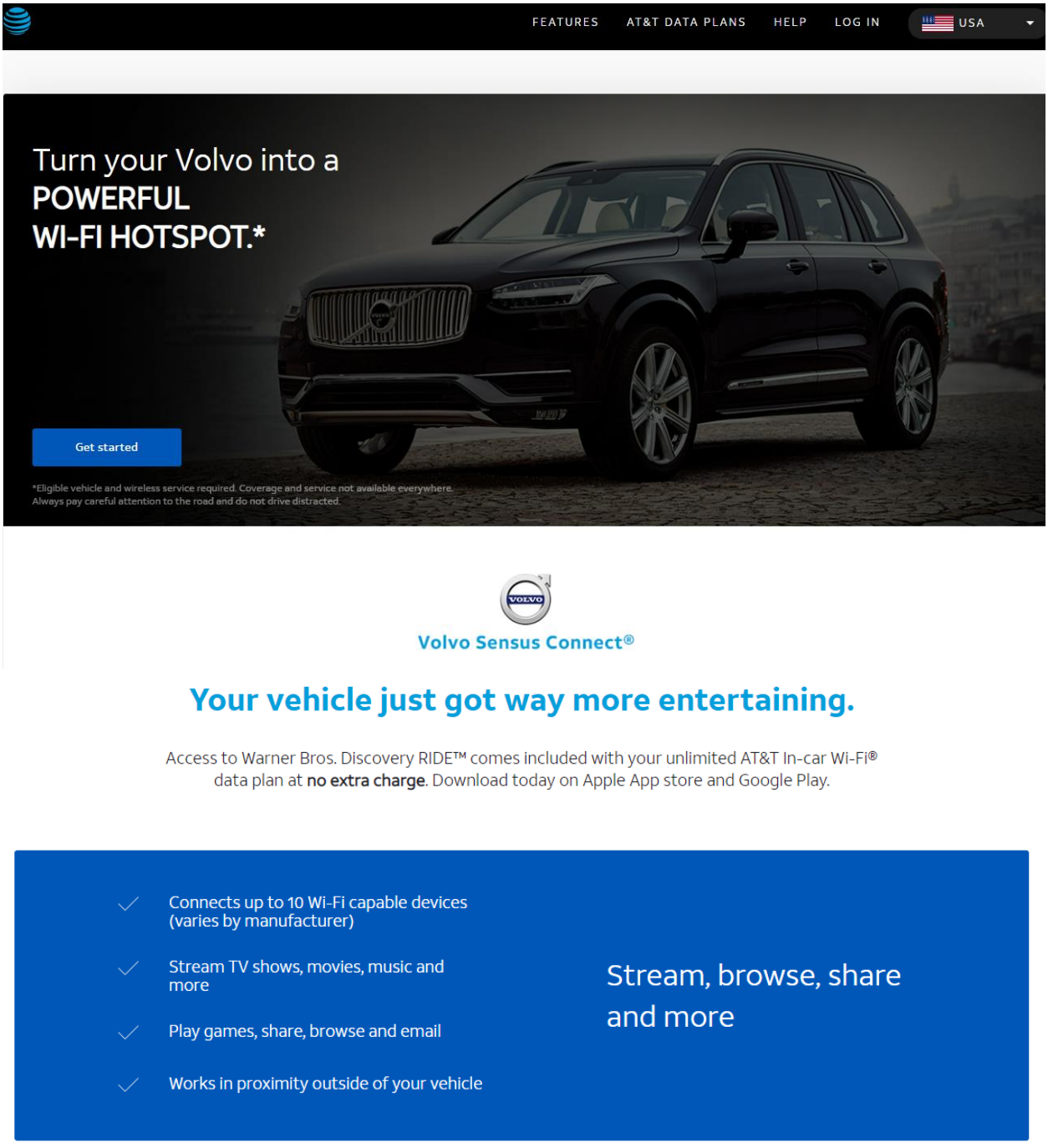
IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

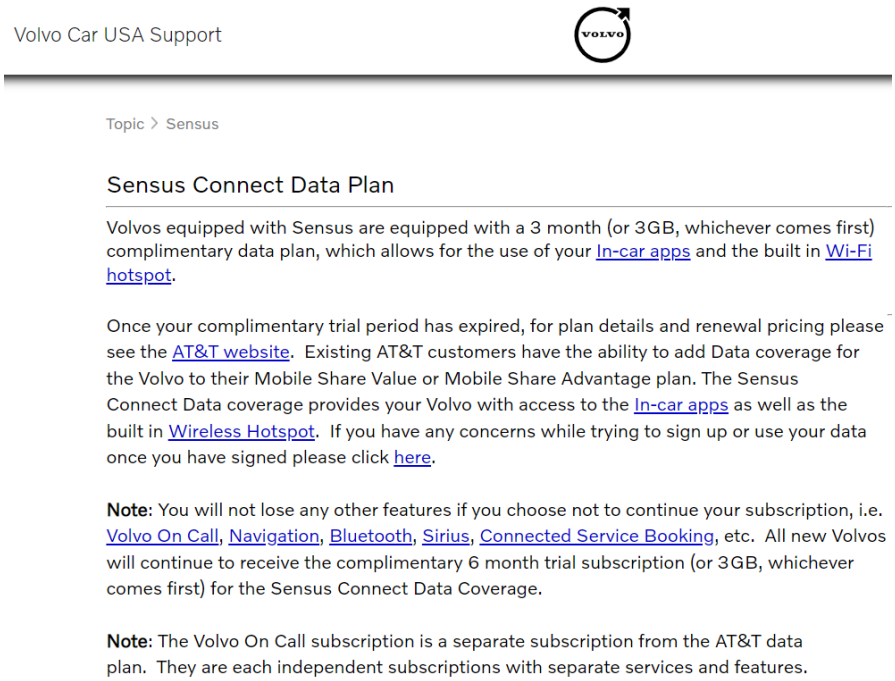
IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 802.11™-2016
(Revision of
IEEE Std 802.11-2012)

See Ex. 31, IEEE 802.11-2016.



Ex. 8, https://myvehicle.att.com/#/volvo/learn?language=en&country=US (last accessed on June 6, 2023).



Volvo Car USA Support

Topic > Sensus

Sensus Connect Data Plan

Volvos equipped with Sensus are equipped with a 3 month (or 3GB, whichever comes first) complimentary data plan, which allows for the use of your In-car apps and the built in Wi-Fi hotspot.

Once your complimentary trial period has expired, for plan details and renewal pricing please see the AT&T website. Existing AT&T customers have the ability to add Data coverage for the Volvo to their Mobile Share Value or Mobile Share Advantage plan. The Sensus Connect Data coverage provides your Volvo with access to the In-car apps as well as the built in Wireless Hotspot. If you have any concerns while trying to sign up or use your data once you have signed please click here.

Note: You will not lose any other features if you choose not to continue your subscription, i.e. Volvo On Call, Navigation, Bluetooth, Sirius, Connected Service Booking, etc. All new Volvos will continue to receive the complimentary 6 month trial subscription (or 3GB, whichever comes first) for the Sensus Connect Data Coverage.

Note: The Volvo On Call subscription is a separate subscription from the AT&T data plan. They are each independent subscriptions with separate services and features.

Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).

170. Upon information and belief, the Volvo Count VI Automobiles' Wi-Fi functionality supports Quality of Service (QoS) capability via the 802.11 standard ("802.11 Wi-Fi"). Upon information and belief, IEEE 802.11-2016 standard defines the Enhanced Distributed Channel Access (EDCA) mechanism for prioritized QoS. This provides access categories (ACs) for differentiating traffic types that have a separate queue for queuing frames to be transferred.

171. Upon information and belief, 802.11 Wi-Fi performs queuing data frames to be transmitted during a transmitting station's transmit opportunity, wherein the data frames are queued in a queue.

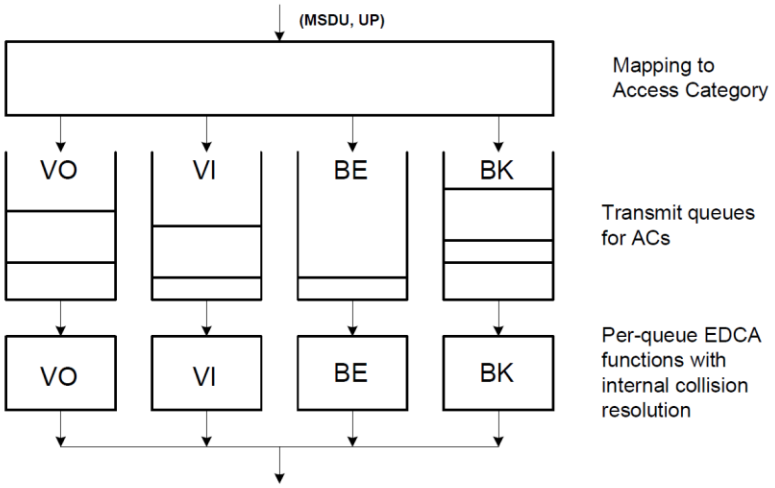


Figure 10-24—Reference implementation model when dot11AlternateEDCAActivated is false or not present

See Ex. 31, IEEE Std 802.11-2016 at p. 1378.

172. Upon information and belief 802.11 Wi-Fi performs wherein the transmit opportunity corresponds to a length of time during which the transmitting station will transmit data frames from the queue to a shared-communications channel, and wherein the transmit opportunity is commenced with a control frame. Upon information and belief, in an EDCA transmission opportunity or TXOP (transmit opportunity), the transmitting station selects frames for transmission from a set of transmission queues. Upon information and belief, TXOP commences with a control frame.

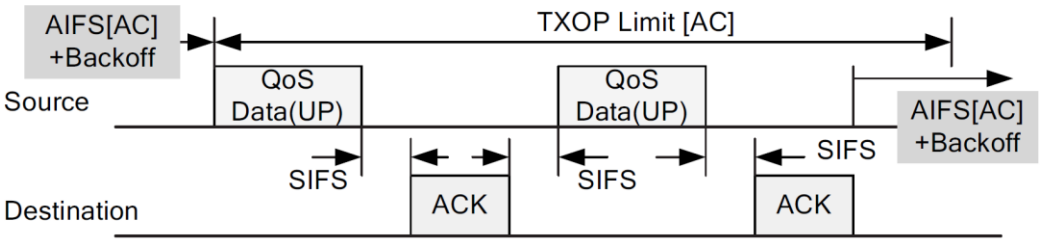


Figure 3.5 EDCA TXOP operation timing structure.

See Ex. 32, Shorey, Rajeev, et al., eds. *Mobile, wireless, and sensor networks: technology, applications, and future directions*. John Wiley & Sons, 2006, p. 54.

173. Upon information and belief, 802.11 Wi-Fi performs setting a length of time for the transmit opportunity based on a priority of the queue.

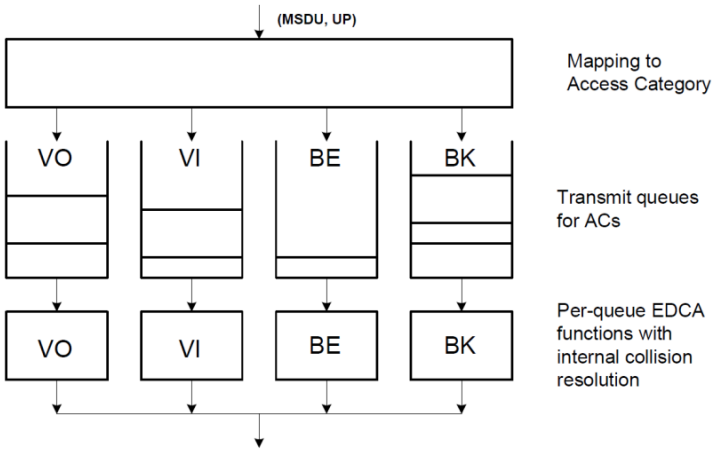


Figure 10-24—Reference implementation model when dot11AlternateEDCAActivated is false or not present

See Ex. 31, IEEE Std 802.11-2016 at p. 1378.

Table 10-1—UP-to-AC mappings

Priority	UP (Same as IEEE 802.1D user priority)	IEEE 802.1D designation	AC	Transmit queue (dot11Alternate-EDCAActivated false or not present)	Transmit queue (dot11Alternate EDCAActivated true)	Designation (informative)
Lowest	1	BK	AC_BK	BK	BK	Background
	2	—	AC_BK	BK	BK	Background
	0	BE	AC_BE	BE	BE	Best Effort
	3	EE	AC_BE	BE	BE	Best Effort
	4	CL	AC_VI	VI	A_VI	Video (alternate)
	5	VI	AC_VI	VI	VI	Video (primary)
	6	VO	AC_VO	VO	VO	Voice (primary)
Highest	7	NC	AC_VO	VO	A_VO	Voice (alternate)

See Ex. 31, IEEE Std 802.11-2016 at pp. 1298-1299.

174. Upon information and belief, Internet connectivity is provided in Volvo Count VI Automobiles through, for example, a trial or subscription service through AT&T, Verizon Wireless, and/or other Internet providers.

175. Accordingly, Volvo is making, using, testing, selling, offering for sale and/or importing into the United States the Volvo Count VI Automobiles that infringe one or more claims of the ’318 Patent.

176. Additionally, Volvo has been, and currently is, actively inducing infringement of the ’318 Patent under 35 U.S.C. § 271(b) and contributorily infringing the ’318 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

177. Volvo knew of the ’318 Patent, or should have known of the ’318 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the ’318 Patent since at least as early receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the ’318 Patent.

178. Volvo has committed, and continue to commit, affirmative acts that cause infringement of one or more claims of the ’318 Patent with knowledge of the ’318 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the ’318 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing, promoting, and instructing its customers on how to use wireless connectivity features in the Volvo Count VI Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the ’318 Patent.

179. Volvo has also committed, and continues to commit, contributory infringement by, *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the ’318 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially

made or especially adapted for use in infringement of the ’318 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

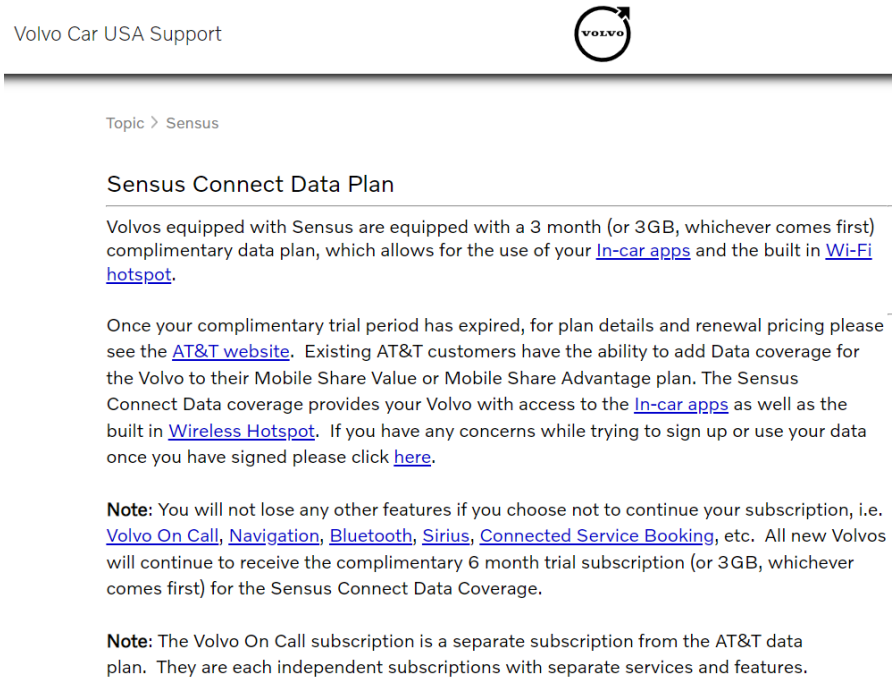
180. As a result of Volvo’s acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT VII

(Volvo’s Infringement of U.S. Patent No. 9,602,608)

181. Paragraphs 1-180 are incorporated by reference as if fully set forth herein.

182. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the ’608 Patent, by making, using, testing, selling, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the ’608 Patent, including, but not limited to C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge and other Volvo vehicles that are equipped with Volvo Connected Navigation or similar functionality (collectively, “Volvo Count VII Automobiles”).



Volvo Car USA Support

Topic > Sensus

Sensus Connect Data Plan

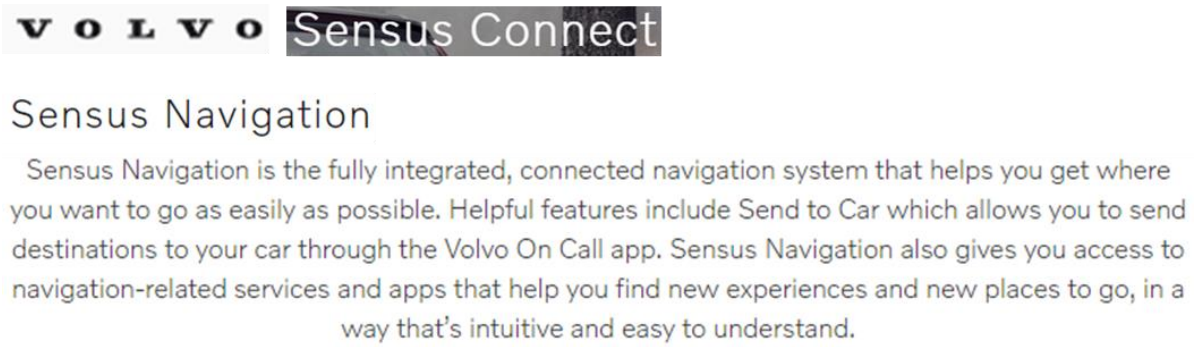
Volvos equipped with Sensus are equipped with a 3 month (or 3GB, whichever comes first) complimentary data plan, which allows for the use of your In-car apps and the built in Wi-Fi hotspot.

Once your complimentary trial period has expired, for plan details and renewal pricing please see the AT&T website. Existing AT&T customers have the ability to add Data coverage for the Volvo to their Mobile Share Value or Mobile Share Advantage plan. The Sensus Connect Data coverage provides your Volvo with access to the In-car apps as well as the built in Wireless Hotspot. If you have any concerns while trying to sign up or use your data once you have signed please click here.

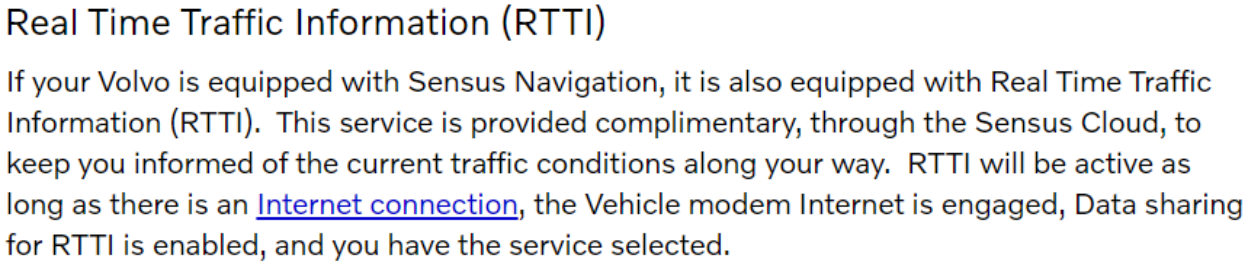
Note: You will not lose any other features if you choose not to continue your subscription, i.e. Volvo On Call, Navigation, Bluetooth, Sirius, Connected Service Booking, etc. All new Volvos will continue to receive the complimentary 6 month trial subscription (or 3GB, whichever comes first) for the Sensus Connect Data Coverage.

Note: The Volvo On Call subscription is a separate subscription from the AT&T data plan. They are each independent subscriptions with separate services and features.

Ex. 9, https://volvo.custhelp.com/app/answers/detail/a_id/9761/~/sensus-connect-data-plan (last accessed on June 6, 2023).



Ex. 33, https://www.volvocars.com/en-ca/l/sensus-navigation/ (last accessed on June 7, 2023).



Ex. 34, https://volvo.custhelp.com/app/answers/detail/a_id/9913/year/2018/model/XC60 (last accessed on June 5, 2023).

183. An exemplary claim, Claim 1 of the '608 Patent, is reproduced below:

The invention claimed is:

1. A electronic computer implemented method for matching users with information, comprising:

receiving a first user preference, a location of a mobile device of the first user, and a geographic area limitation;

storing, for a plurality of objects, a set of attributes of each corresponding object, and a location of the corresponding object;

determining an object of the plurality of objects that matches the first user based on at least:

(a) the set of attributes for the object satisfies the first user preference, and

(b) the distance between the received location of the mobile device of the first user and the object is within the geographic area limitation;

sending to the first user, in response to a positive outcome of the determining, information about the matching object; and

wherein the matching object is a person, place and/or thing.

184. Upon information and belief, the Volvo Count XII Automobiles are equipped with a navigation system that performs or can perform each and every limitation of at least claim 8 of the '608 Patent, including but not limited to the Volvo Connected Navigation System ("Volvo Navigation System").

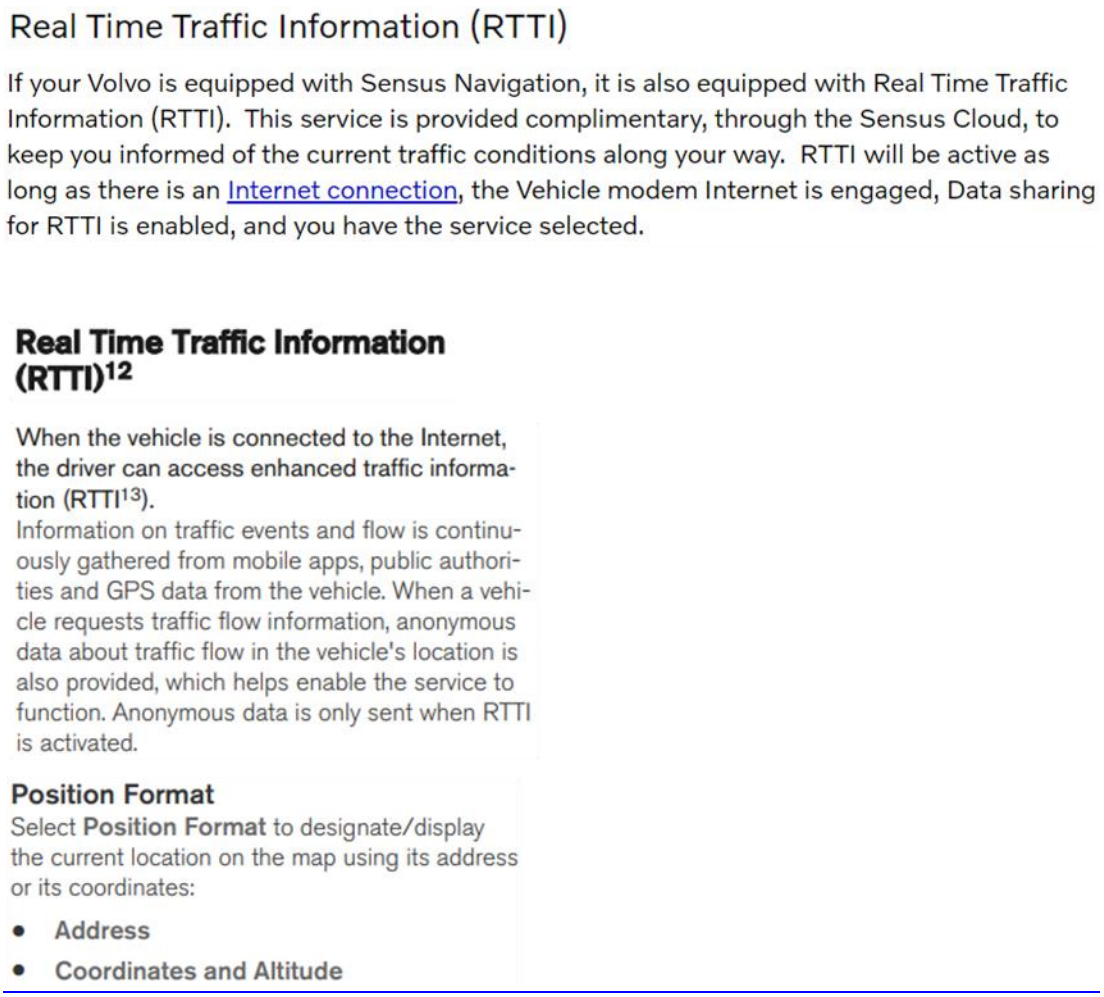
185. Upon information and belief, the Volvo Count VII Automobiles equipped with Volvo Navigation System comprises an electronic computer implemented method for matching users with information.

Sensus on the XC90, S90, V90 and V90 Cross Country models.

Ex. 35, https://volvo.custhelp.com/app/answers/detail/a_id/9585/ (last accessed on June 5, 2023).

186. Upon information and belief, the Volvo Count VII Automobiles equipped with Volvo Navigation System are capable of receiving a first user preference, a location of a mobile device of the first user, and a geographic area limitation.

https://www.youtube.com/watch?v=0ay_eQ2n4qg 0:44/13:16 (last accessed on June 5, 2023).



Real Time Traffic Information (RTTI)

If your Volvo is equipped with Sensus Navigation, it is also equipped with Real Time Traffic Information (RTTI). This service is provided complimentary, through the Sensus Cloud, to keep you informed of the current traffic conditions along your way. RTTI will be active as long as there is an Internet connection, the Vehicle modem Internet is engaged, Data sharing for RTTI is enabled, and you have the service selected.

Real Time Traffic Information (RTTI)[12]

When the vehicle is connected to the Internet, the driver can access enhanced traffic information (RTTI[13]).
Information on traffic events and flow is continuously gathered from mobile apps, public authorities and GPS data from the vehicle. When a vehicle requests traffic flow information, anonymous data about traffic flow in the vehicle's location is also provided, which helps enable the service to function. Anonymous data is only sent when RTTI is activated.

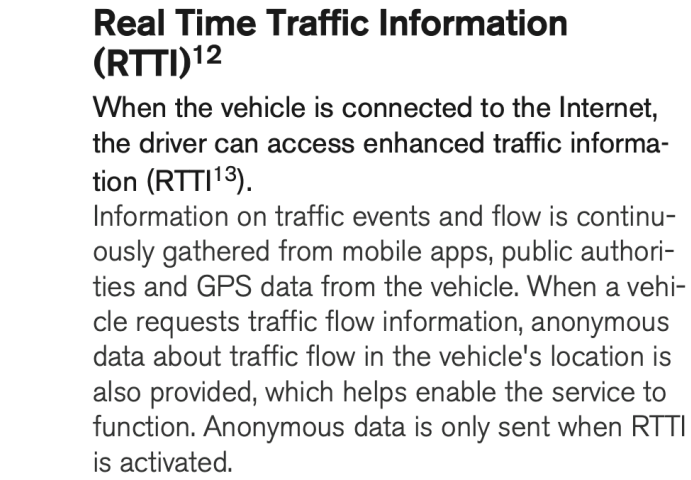
Position Format
Select **Position Format** to designate/display the current location on the map using its address or its coordinates:

- **Address**
- **Coordinates and Altitude**

Ex. 34, https://volvo.custhelp.com/app/answers/detail/a_id/9913/year/2018/model/XC60 (last accessed on June 5, 2023).

187. Upon information and belief, the Volvo Count VII Automobiles equipped with Volvo Navigation System are capable of storing, for a plurality of objects, a set of attributes of each corresponding object, and a location of that corresponding object;

188. Upon information and belief, the Volvo Count VII Automobiles equipped with Volvo Navigation System are capable of determining an object of the plurality of objects in the database that matches the first user based on at least (a) the set of attributes for the object satisfies the first user preference, and (b) the distance between the received location of the mobile device of the first user and the object is within the geographic area limitation.



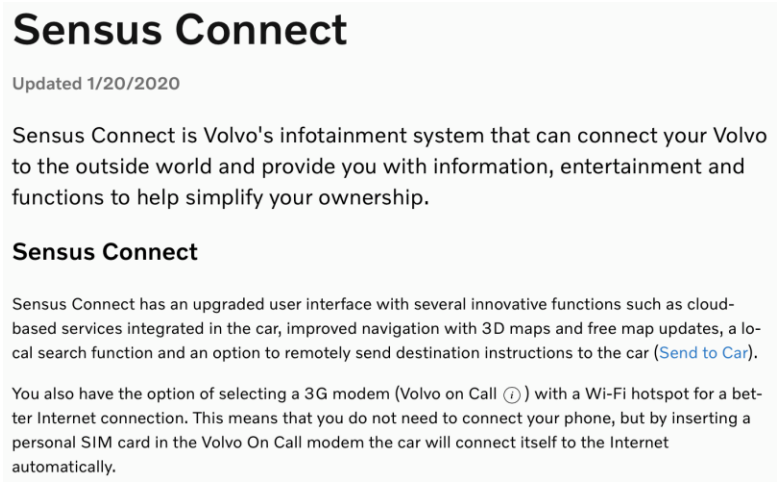
Real Time Traffic Information (RTTI)[12]

When the vehicle is connected to the Internet, the driver can access enhanced traffic information (RTTI[13]).

Information on traffic events and flow is continuously gathered from mobile apps, public authorities and GPS data from the vehicle. When a vehicle requests traffic flow information, anonymous data about traffic flow in the vehicle's location is also provided, which helps enable the service to function. Anonymous data is only sent when RTTI is activated.

Ex. 36, https://volvornt.harte-hanks.com/manuals/2018/17wk46/SensusNavigation_MY18_en-US_TP25394.pdf at p. 20 of 42.

189. Upon information and belief, the Volvo Count VII Automobiles equipped with Volvo Navigation System are capable of sending to the first user, in response to a positive outcome of the determining, information about the matching object; and wherein the matching object is a person, place and/or thing.



Sensus Connect

Updated 1/20/2020

Sensus Connect is Volvo's infotainment system that can connect your Volvo to the outside world and provide you with information, entertainment and functions to help simplify your ownership.

Sensus Connect

Sensus Connect has an upgraded user interface with several innovative functions such as cloud-based services integrated in the car, improved navigation with 3D maps and free map updates, a local search function and an option to remotely send destination instructions to the car (Send to Car).

You also have the option of selecting a 3G modem (Volvo on Call ⓘ) with a Wi-Fi hotspot for a better Internet connection. This means that you do not need to connect your phone, but by inserting a personal SIM card in the Volvo On Call modem the car will connect itself to the Internet automatically.

Ex. 37, https://www.volvocars.com/en-ca/support/topics/article/58cb6f9d45c378f7c0a801513f44073b (last accessed on June 5, 2023).

190. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count VII Automobiles equipped with the Volvo Navigation System that directly infringe one or more claims of the ’608 Patent.

191. Additionally, Volvo has been, and currently is, actively inducing infringement of the ’608 Patent under 35 U.S.C. § 271(b) and contributorily infringing the ’608 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

192. Volvo knew of the ’608 Patent, or should have known of the ’608 Patent, but was willfully blind to it its existence. Volvo has had actual knowledge of the ’608 Patent not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the ’608 Patent.

193. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the ’608 Patent with knowledge of the ’608 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the ’608 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing, promoting, and instructing its customers on how to use the claimed Volvo Navigation System in the Volvo Count VII Automobiles that when used in their normal and customary way as intended and designed by Volvo infringe one or more claims of the ’608 Patent.

194. Volvo has also committed, and continues to commit, contributory infringement by, *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the ’608 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the ’608 Patent and is not a staple article or commodity of commerce suitable for a substantial non-infringing use.

195. As a result of Volvo's acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

COUNT VIII

(Volvo's Infringement of U.S. Patent No. 7,484,008)

196. Paragraphs 1-195 are incorporated by reference as if fully set forth herein.

197. Volvo has directly infringed, and continues to directly infringe, literally and/or by the doctrine of equivalents, individually and/or jointly, the '008 Patent, by making, using, performing, testing, selling, leasing, offering for sale and/or importing into the United States vehicles that embody products and/or services that infringe the '008 Patent including, but not limited to, the Volvo vehicle lines containing the MOST Intelligent Network Interface Controllers to power their infotainment systems including but not limited to the C40, V40, XC40, S60, V60, XC60, S90, V90, XC90, and XC90 Recharge (collectively, "Volvo Count VIII Automobiles").

198. As an exemplary claim, Claim 75 of the '008 Patent is reproduced below:

> *75. A method node configured to couple to a plurality of network elements, wherein the plurality of network elements includes a local area network and at least one peripheral electronic device coupled to the local area network, the gateway node comprising:*
>
> *at least one interface port to receive data packets;*
>
> *at least one real-time processor operable to configured to perform real-time operations on the data packets; and*
>
> *at least one application processor configured to perform high level processing functions, wherein the at least one real-time interface processor is coupled between the at least one interface port and the at least one application processor.*

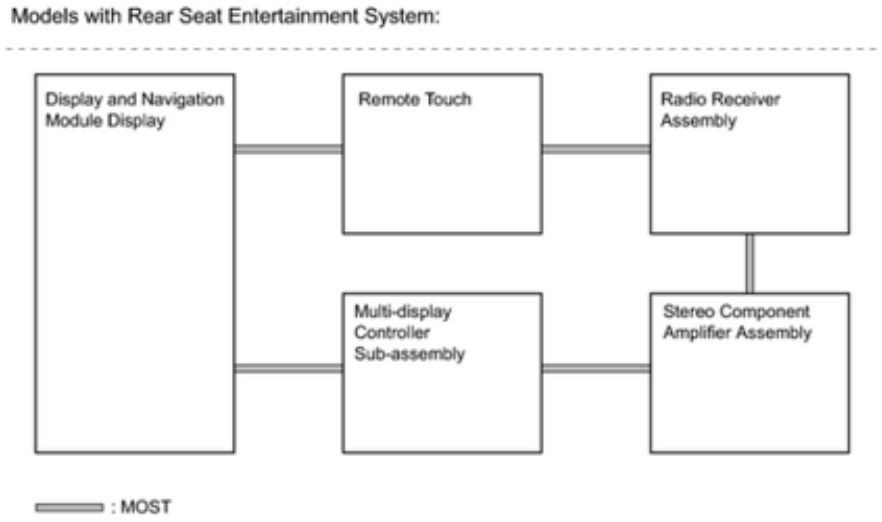
199. Upon information and belief, Volvo and the Volvo Count VIII Automobiles perform each and every limitation of at least claim 75 of the ’008 Patent. Upon information and belief, the Volvo Count VIII Automobiles include the Volvo Infotainment system that use MOST.

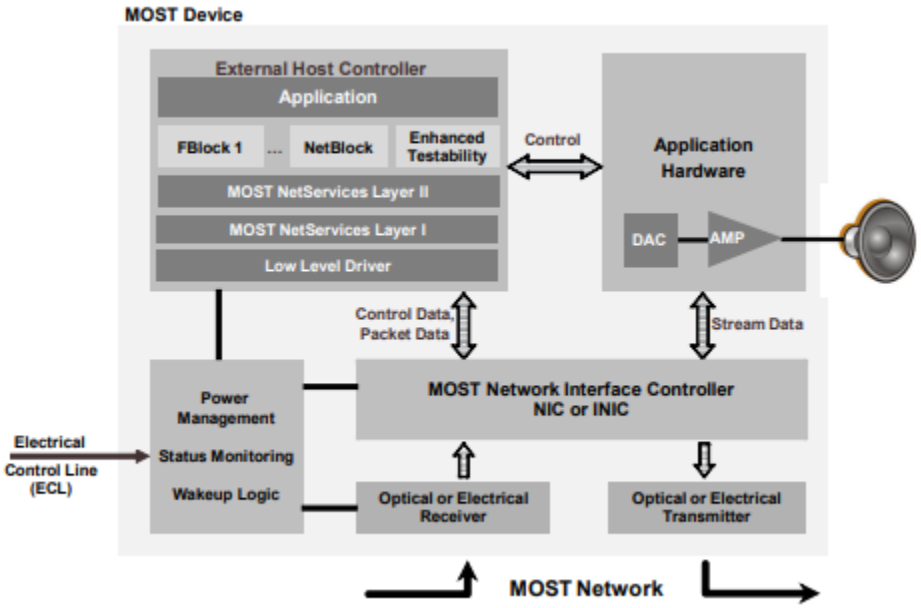
200. Upon information and belief, the infotainment architecture of the Volvo Count VIII Automobiles with navigation systems and rear seat entertainment systems include, *inter alia*, a plurality of network elements including at least one gateway node and at least one local area network coupled among at least one peripheral electronic device, as reproduced below.

201. Upon information and belief, the infotainment architecture of the Volvo Count VIII Automobiles with navigation systems and rear seat entertainment systems include, *inter alia*, a gateway node. For example, the Display and Navigation Module Display Electronic Control Unit (ECU) of the infotainment systems of the Volvo Count VIII Automobiles with navigation systems and rear seat entertainment systems, *inter alia*, perform the role of gateway between local area networks, such as but not limited to, the CAN network and the MOST network. As a further example, the Display and Navigation Module Display Electronic Control Unit (ECU) of the infotainment systems of the Volvo Count VIII Automobiles is coupled to a peripheral electronic device, such as Power Management Control ECU, as reproduced below.

202. Upon information and belief, the Volvo Count VIII Automobiles include the gateway node comprising at least one interface port to receive data packets; at least one real-time processor operable to configured to perform real-time operations on the data packets; and at least one application processor configured to perform high level processing functions, wherein the at least one real-time interface processor is coupled between the at least one interface port and the at least one application processor.

203. Upon information and belief, the Display and Navigation Module Display ECU of the infotainment systems of the Volvo Count VIII Automobiles with navigation systems and rear seat entertainment systems, *inter alia*, is based on a standard MOST ECU architecture, that includes a MOST Intelligent Interface Controller (INIC) that manages the flow of information to and from the MOST bus, and an External Host Controller that is responsible for high level application processing, as reproduced below.





See Ex. 22, MOST Specification Rev. 3.0 E2 (07/2010) at p. 191.

204. Accordingly, Volvo is using, offering for sale, or selling in the United States the Volvo Count VIII Automobiles equipped with Infotainment Systems that directly infringe one or more claims of the '008 Patent.

205. Additionally, Volvo has been, and currently is, actively inducing infringement of the '008 Patent under 35 U.S.C. § 271(b) and contributorily infringing the '008 Patent under 35 U.S.C. § 271(c) either literally and/or by the doctrine of equivalents.

206. Volvo knew of the '008 Patent, or should have known of the '008 Patent, but was willfully blind to its existence. Volvo has had actual knowledge of the '008 Patent since not later than receipt of a letter dated June 7, 2023, and received on the same date. By the time of trial, Volvo will have known and intended (since receiving such notice) that its continued actions would infringe and actively induce and contribute to the infringement of one or more claims of the '008 Patent.

207. Volvo has committed, and continues to commit, affirmative acts that cause infringement of one or more claims of the '008 Patent with knowledge of the '008 Patent and knowledge or willful blindness that the induced acts constitute infringement of one or more claims of the '008 Patent. As an illustrative example only, Volvo induces such acts of infringement by its affirmative action of providing and promoting the described hardware and/or software components and features in the Volvo Count VIII Automobiles that when used in their normal and customary way as intended and designed by Volvo, infringe one or more claims of the '008 Patent. As an illustrative example only, Volvo induces such acts of infringement by providing its customers instructions on how to use its products and services in a manner or configuration that infringe one or more claims of the '008 Patent.

208. Volvo has also committed, and continues to commit, contributory infringement, by *inter alia*, knowingly selling products and/or methods or services that when used cause the direct infringement of one or more claims of the '008 Patent by a third party, and which have no substantial non-infringing uses, or include a separate and distinct component that is especially made or especially adapted for use in infringement of the '008 Patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use.

209. Volvo has actively induced, and continues to actively induce infringement of one or more claims of the '008 Patent by intending that others use, offer for sale, or sell in the United States, products and/or method embodied therein as covered by one or more claims of the '008 Patent, including but not limited to MOST networks implemented in, for example, the infotainment systems of the Volvo Count VIII Automobiles. Volvo provides these products and practices the methods embodied within the products covered by one or more claims of the '008 Patent to others including customers, resellers, and end-user customers who in turn use, provide for use, offer for sale, or sell in the United States, the products and/or services and methods that directly infringe one or more claims of the '008 Patent.

210. As a result of Volvo's acts of infringement, Plaintiffs have suffered and will continue to suffer damages in an amount to be proven at trial.

DEMAND FOR JURY TRIAL

211. Under Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiffs respectfully request a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs respectfully request the following relief:

A. A judgment that the Patents-in-Suit are valid and enforceable;

B. A judgment that Defendants directly infringe, contributorily infringe, and/or actively induce infringement of one or more claims of *each of* the Patents-in-Suit;

C. A judgment that awards Plaintiffs all damages adequate to compensate them for Defendants' direct infringement, contributory infringement, and/or induced infringement, of the Patents-in-Suit, including all pre- judgment and post- judgment interest at the maximum rate permitted by law;

D. A judgment that awards Plaintiffs all appropriate damages under 35 U.S.C. § 284 for Defendants' past infringement with respect to the Patents-in-Suit;

E. A judgment that awards Plaintiffs all appropriate damages under 35 U.S.C. § 284 for Defendants' continuing or future infringement, up until the date such judgment is entered with respect to the Patents-in-Suit, including ongoing royalties, pre- and post-judgment interest, costs, and disbursements as justified under 35 U.S.C. § 284;

F. A judgment that this case is exceptional under 35 U.S.C. § 285;

G. An accounting of all damages not presented at trial; and

H. A judgment that awards Plaintiffs their costs, disbursements, attorneys' fees, and such further and additional relief as is deemed appropriate by the Court.

Dated: June 8, 2023

RESPECTFULLY SUBMITTED,

By: */s/ Jonathan K. Waldrop*

Jonathan K. Waldrop (CA Bar No. 297903)
(Admitted in this District)
jwaldrop@kasowitz.com
Darcy L. Jones (CA Bar No. 309474)
(Admitted in this District)
djones@kasowitz.com
Marcus A. Barber (CA Bar No. 307361)
(Admitted in this District)
mbarber@kasowitz.com
John W. Downing (CA Bar No. 252850)
(Admitted in this District)
jdowning@kasowitz.com
Heather S. Kim (CA Bar No. 277686)
(Admitted in this District)
hkim@kasowitz.com
ThucMinh Nguyen (CA Bar No. 304382)
(Admitted in this District)
tnguyen@kasowitz.com
KASOWITZ BENSON TORRES LLP
333 Twin Dolphin Drive, Suite 200
Redwood Shores, California 94065
Telephone: (650) 453-5170
Facsimile: (650) 453-5171

Mark D. Siegmund (TX Bar No. 24117055)
msiegmund@cjsjlaw.com
CHERRY JOHNSON SIEGMUND JAMES PLLC
The Roosevelt Tower
400 Austin Avenue, 9th Floor
Waco, Texas 76701
Telephone: (254) 732-2242

Attorneys for Plaintiffs
INTELLECTUAL VENTURES I LLC, and
INTELLECTUAL VENTURES II LLC

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing instrument was served or delivered electronically to all counsel of record on this 8th day of June, 2023, via the Court's CM/ECF system.

By: */s/ Jonathan K. Waldrop*
Jonathan .K. Waldrop