

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYUNDAI MOTOR COMPANY
Petitioner

v.

MEL NAVIP LLC
Patent Owner.

U.S. Patent No. 8,244,465 to Arita

Case No.: IPR2024-00172

**PETITION FOR *INTER PARTES* REVIEW OF
CLAIMS 1-3 AND 5 OF U.S. PATENT 8,244,465 UNDER 35
U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.100 ET SEQ.**

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1008	U.S. Patent No. 7,023,456 to Huber et al. (“Huber”)
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1018	U.S. Patent No. 6,178,380 to Millington
1019	International Patent Pub. No. WO2004/076976A1
1020	Japanese Patent App. Pub. No. JP2002372909A
1021	Certified English Translation of Japanese Patent App. Pub. No. JP2002372909A
1022	Japanese Patent App. Pub. No. JPH24285A
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1024	Declaration of Dr. Sylvia Hall-Ellis
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1027	Exhibit B to MEL NavIP LLC’s Infringement Contentions in <i>MEL NavIP LLC v. General Motors Company et al.</i> , Case No. 23-cv-00175 (E.D. Tex.)
1028	Docket Control Order in <i>MEL NavIP LLC v. Hyundai Motor Company et al.</i> , Case No. 23-cv-00176 (E.D. Tex.)
1029	Dingus, Thomas A. et al., “ <i>Human factors engineering the TravTek driver interface</i> ,” Vehicle Navigation and Information Systems Conference, pp. 749-755, 1991
1030	Dingus, Thomas A. et al., “ <i>Some human factors design issues and recommendations for automobile navigation information systems</i> ,” Transportation Research Part C: Emerging Technologies, Volume 1, Issue 2, pp. 119-131, 1993

CLAIMS LISTING

[Claim 1, 1-PRE] A navigation system comprising:

[1a] a map data storage section for storing map data together with attributes and classes of the map data, the map data being composed of roads necessary for a route search and display elements including city centers and facilities, and the city centers being a display element each representing a city and indicating a representative position of the city, wherein the attributes are indicative of whether or not each of the roads should be displayed for each of a plurality of map scales;

[1b] a display section for displaying the map data;

[1c] an input section for inputting an instruction from a user; and

[1d] a control section for carrying out:

[1e] a procedure of calculating a route between an own-vehicle position and a destination represented by one of the display elements, the destination being instructed via the input section,

[1f] in accordance with one of the plurality of map scales instructed via the input section, a procedure of displaying a map on the display section by:

[1g] selecting the roads indicated by the attributes as being displayable according to the instructed map scale, and by selecting the display elements based on ranks,

[1h] further selecting each of the roads that is part of the calculated route but not indicated by the attributes as being displayable according to the instructed map scale, and

[1i] displaying the selected roads and the selected display elements on the display selection as part of the map.

[Claim 2] The navigation system according to claim 1, wherein the control section displays each selected road not indicated by the attributes as being displayable according to the instructed map scale on the display section in a fashion different from the other selected roads.

[Claim 3] The navigation system according to claim 1, wherein the route calculation is performed between the own-vehicle position and one of the selected display elements, and the route calculation is performed under a condition recommended by navigation or under a condition which is designated by the user and is input from the input section.

[Claim 5, 5-PRE] A display method of a road network in a navigation system having a map data storage section for storing map data, which is composed of roads necessary for a route search and display elements including city centers and facilities, together with attributes and classes of the map data, the attributes being indicative of whether or not each of the roads should be displayed for each of a plurality of map scales, the navigation system also having a position information

acquiring section for obtaining position information on a vehicle, a control section including a drawing memory, an input section for inputting an instruction from a user, and a display section for displaying the map data, the display method of the road network in the navigation system comprising:

[5a] calculating a route between an own-vehicle position and a destination represented by one of the display elements, the destination being instructed by the user via the input section;

[5b] drawing, according to one of a plurality of map scales designated by the user via the input section, a map on the drawing memory by:

[5c] selecting the roads indicated by the attributes as being displayable according to a designed map scale, the selected roads including an own-vehicle position obtained by the position information acquiring section,

[5d] drawing the selected roads and one or more of the display elements on the drawing memory;

[5e] further selecting each of the roads that is part of the calculated route produced as a result of the route calculation, but not indicated by the attributes as being displayable according to the designated map scale, on the drawing memory; and

[5f] displaying the road network drawn on the drawing memory on the display section.

I. INTRODUCTION

Hyundai Motor Company (“Petitioner”) hereby seeks *inter partes* review (“IPR”) and cancellation of claims 1-3 and 5 (collectively, “the Challenged Claims”) of U.S. Patent No. 8,244,465 (“the ‘465 patent”).

II. GROUNDS FOR STANDING UNDER 37 C.F.R. §42.104

Petitioner certifies that the ‘465 patent is available for IPR and Petitioner is not barred/estopped from requesting cancellation of the Challenged Claims. Petitioner respectfully requests cancellation of the Challenged Claims on the following Grounds:

Ground	‘465 Patent Claims	Basis for Obviousness
Ground 1	1-3 and 5	Yokota in combination with the knowledge of a POSITA
Ground 2	1-3 and 5	McDonough in combination with Huber and Tanizaki

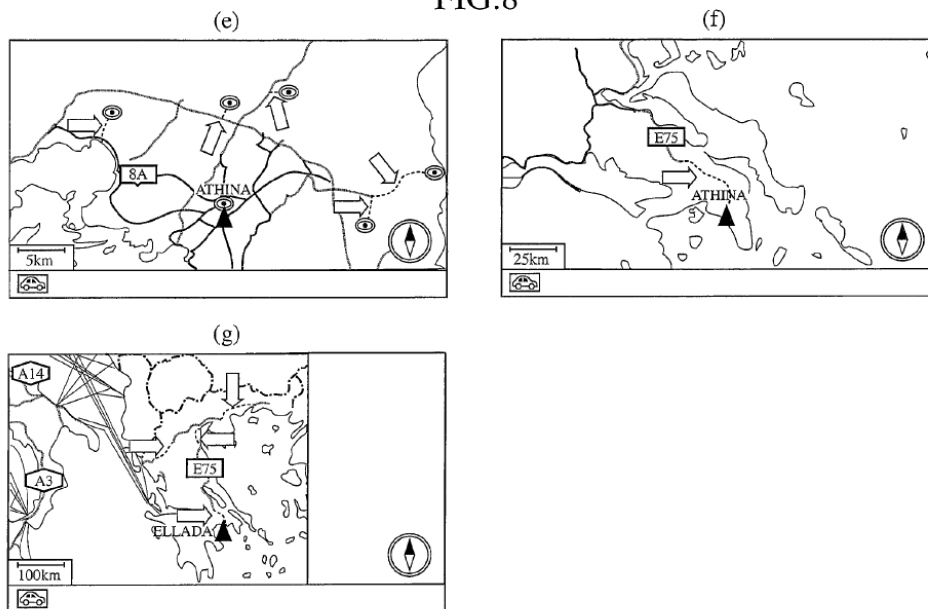
III. BACKGROUND

A. The ‘465 Patent

The ‘465 patent “relates to a navigation system and a display method of a road network on the same system.” (EX1001 at 1:7-8.) The navigation system comprises a control section 1 that calculates a route from the vehicle’s current position to a driver-designated destination. (*Id.* at 4:58-62, 5:30-37, 6:7-15, 7:28-36.) Then, “according to the map scale designated via the input section 2, the control

section 1 selects roads based on their attributes and display elements based on their ranks.” (*Id.* at 4:30-34; *see also id.* at 5:54-61, 7:7-14.) The control section 1 then selects the roads that are part of the calculated route. (*Id.* at 6:25-28, 7:37-40.) For a given map scale, a road that is included in the calculated route will be displayed (*e.g.*, with dotted lines) even if the road would not normally be displayed at that scale. (*Id.* at 7:59-8:3, 8:14-27, 8:28-35, 9:34-45.)

FIG.8



(*Id.* at FIG. 8; *see also id.* at 3:38-44.)

Figure 2 of the ‘465 patent is reproduced below and “shows an example of the road attributes and classes to be stored in the map data storage section 5 in a table fashion.” (*Id.* at 4:1-3.) “The table shown [in FIG. 2] is used for deciding whether to display on a particular map scale in accordance with the road attributes and scales of cities.” (*Id.* at 4:4-17.)

FIG. 2

Relationships Between Map And Map Scale										
Road Attributes	Map Scale									
	50m	100m	250m	500m	1km	2.5km	5km	10km	25km	100km
Road Class 1	X	X	X	X	X	X	X	X	X	X
Road Class 2	X	X	X	X	X	X	X	X	X	X
Road Class 3	X	X	X	X	X	X	X			
Road Class 4	X	X	X							
Road Class 5	X	X								
District/National Highway Name									X	X
Position Information Icon	X	X	X	X						
Facility Position Icon	X	X	X	X						
Main City Icon : < 20 k People	X	X	X	X	X					
Main City Icon : ≥ 20 k People				X	X					
Main City Icon : ≥ 100 k People				X	X					
Main City Icon : ≥ 500 k People				X	X	X				
Main City Icon : ≥ One Hundred Million People				X	X	X	X	X	X	

(*Id.* at FIG. 2.)

The ‘465 patent asserts that the point of novelty between the prior art and the ‘465 patent is that the claimed navigation system of the ‘465 patent maintains the continuity of the calculated route by preventing the route from being displayed with an “artificial break.” (*Id.* at 7:59-8:3, 8:14-27, 8:28-35, 9:34-45.)

B. The Challenged Claims Of The ‘465 Patent.

Of the Challenged Claims, only Challenged Claims 1 and 5 are independent. (EX1001 at claims 1, 5.) Challenged Claim 1 is directed to an apparatus (*i.e.*, a “navigation system”), while Challenged Claim 5 is directed to a method performed using the system of Challenged Claim 1. (*Id.*; *see also* EX1002 at 243.) There are only a few material differences between Challenged Claims 1 and 5. (EX1011.)

C. Priority Date

The ‘465 patent claims priority to a Japanese patent application filed on April 9, 2007. (EX1001 at [30].) For the purposes of this proceeding, Petitioner does not dispute the ‘465 patent’s claimed priority date.

D. The Prosecution History Of The ‘465 Patent.

On December 22, 2011, the Examiner issued a non-final office action rejecting pending claims 1-6 as obvious over Millington (U.S. Patent No. 6,178,380) in view of Harada (U.S. Patent No. 6,061,003). (EX1002 at 226.) In response, the Applicant amended the pending claims and argued that the prior art does not disclose the combination of limitations set forth in the amended claims. (*Id.* at 238-240, 242.)

Regarding Millington, the Applicant argued that while “Millington does suggest that a road segment, which is not normally displayable at the highest zoom-out because of its rank, could be displayed if it is either the current road segment, the previous or next cross street, or a panned road segment,” “Millington does not teach or even suggest choosing to display a road segment which is included in the calculated route, but not indicated as being displayable at the current scale by its rank/attribute, as presently claimed.” (*Id.* at 243.)

Regarding Harada, the Applicant similarly argued that “Harada does not disclose the use of attributes to indicate whether or not roads are displayable

according to a particular scale, and thus does not even suggest overriding any such attribute for a road which is part of the calculated route.” (*Id.*)

The Examiner subsequently withdrew the rejection of the pending claims and issued a Notice of Allowability. (*Id.* at 248.)

E. A Person of Ordinary Skill in the Art (“POSITA”)

A POSITA in the field of the ‘465 patent as of its earliest effective filing date (*i.e.*, April 9, 2007) would have had an undergraduate degree in electrical engineering, computer engineering, computer science, or an equivalent degree, as well as at least three years of experience in the design and implementation of navigation systems. (EX1003, ¶36.)

F. Claim Construction

Petitioner does not believe any terms require construction at this time, and, therefore, applies the plain and ordinary meanings of the limitations and terms of the Challenged Claims. Petitioner reserves the right to propose specific constructions if appropriate during this proceeding.

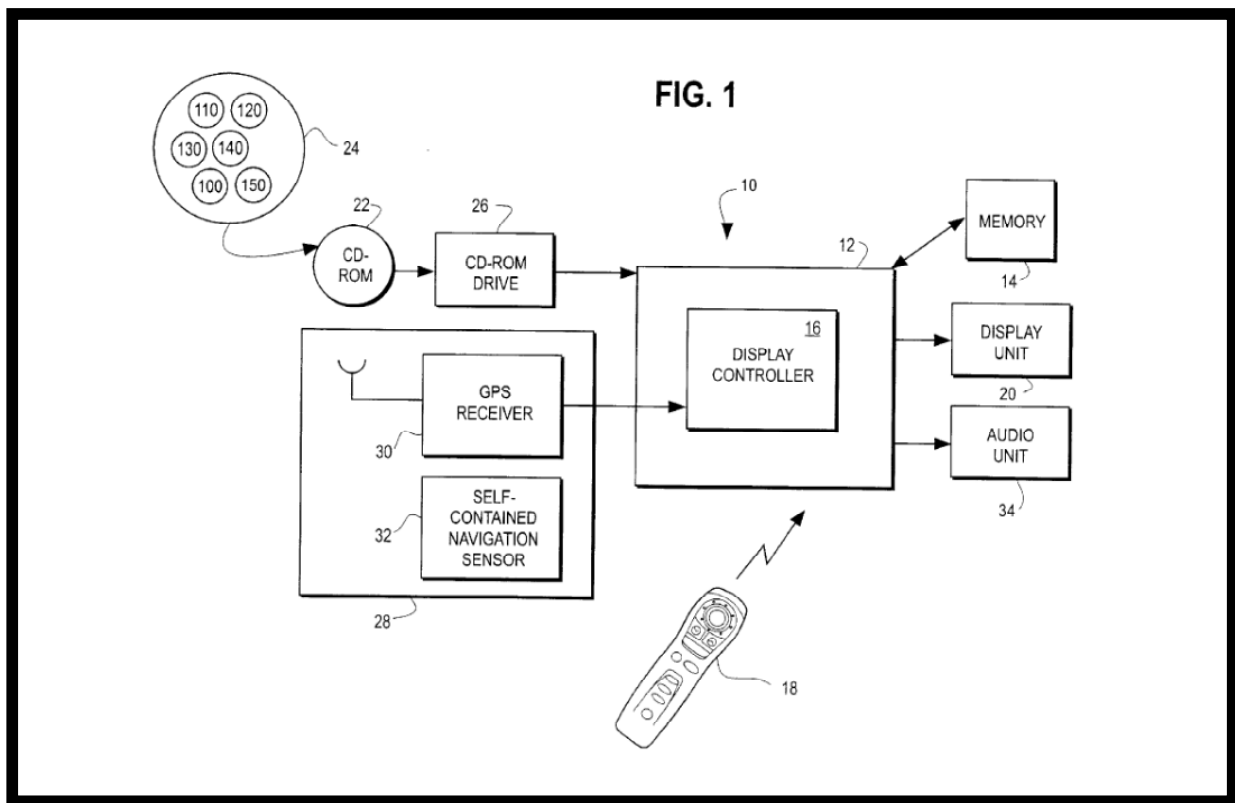
IV. SPECIFIC GROUNDS OF UNPATENTABILITY

A. GROUND 1: Yokota In Combination With The Knowledge Of A POSITA Renders Obvious Challenged Claims 1-3 And 5.

1. Overview Of U.S. Patent No. 6,587,787 (“Yokota”).

Yokota was issued on July 1, 2003, and is thus prior art to the ‘465 patent under pre-AIA §102(b). (EX1005 at [45].)

Yokota is directed to a navigation system 10 that can display maps “at a plurality of scale, or zoom, levels.” (EX1005 at 1:35-43, 4:19-30; *see also id.* at Abstract, 6:9-14.) Yokota’s navigation system 10 “selectively displays or does not display any given road based on both display scale and the importance, or priority, of the road.” (*Id.* at Abstract.) Yokota’s navigation system 10 is shown below in Figure 1:



(*Id.* at FIG. 1.)

“[A] display controller 16 uses the road priority levels to determine the appropriate set of roads to display on a given map display.” (*Id.* at 9:8-10.) “For instance, a default road priority level might be to display only interstate highways

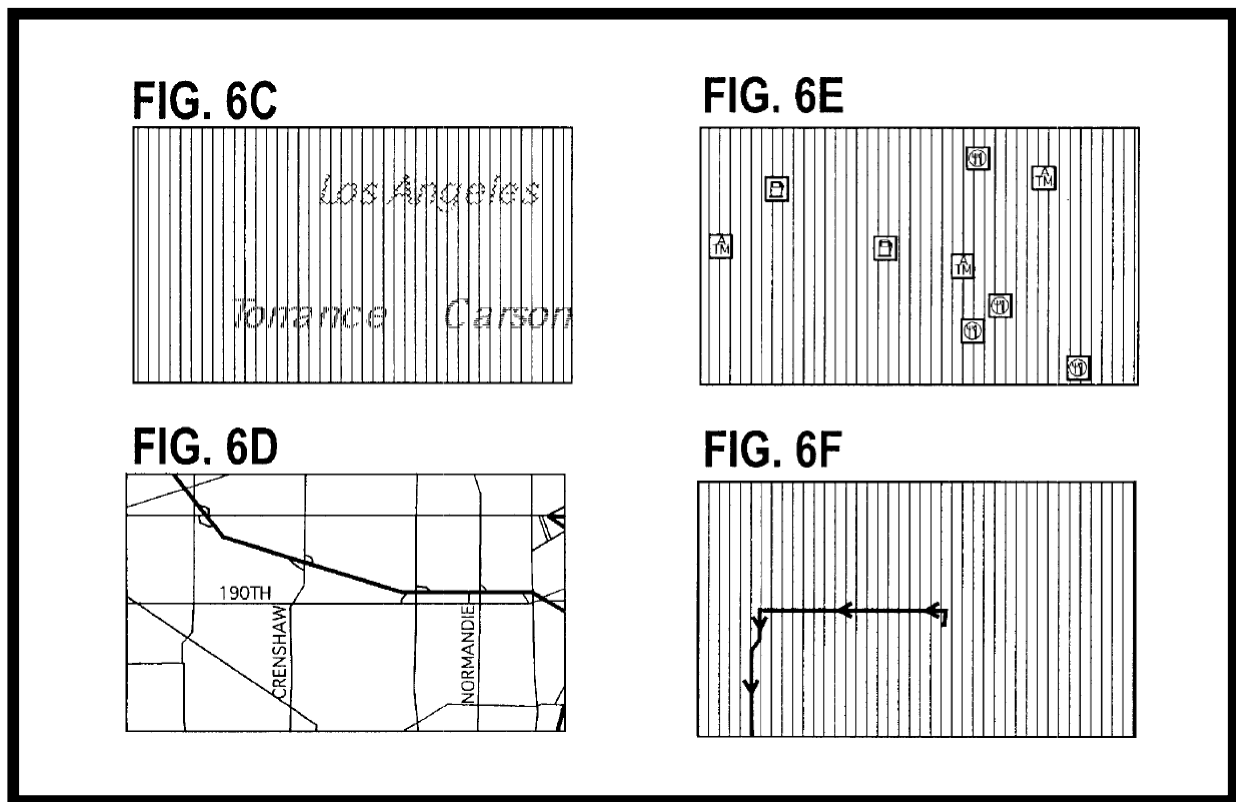
and roads at exits from interstate highways on very small-scale map displays.” (*Id.* at 9:10-12.) “Preferably, there is at least one road priority level for each map scale level.” (*Id.* at 9:13-14.) Table 3, which is reproduced below, illustrates a “sample set of road priority levels, i.e. when to display certain roads”:

TABLE 3					
	Scale				
	Smallest	Small	Medium	Large	Largest
Inter-state	Shown	Shown	Shown	Shown	Shown
Major Hwys	Upgradable	Shown	Shown	Shown	Shown
Minor Hwys	Omitted	Upgradable	Shown	Shown	Shown
Major Roads	Omitted	Omitted	Upgradable	Shown	Shown
Minor Roads	Omitted	Omitted	Omitted	Upgradable	Shown

(*Id.* at 9:15-30.)

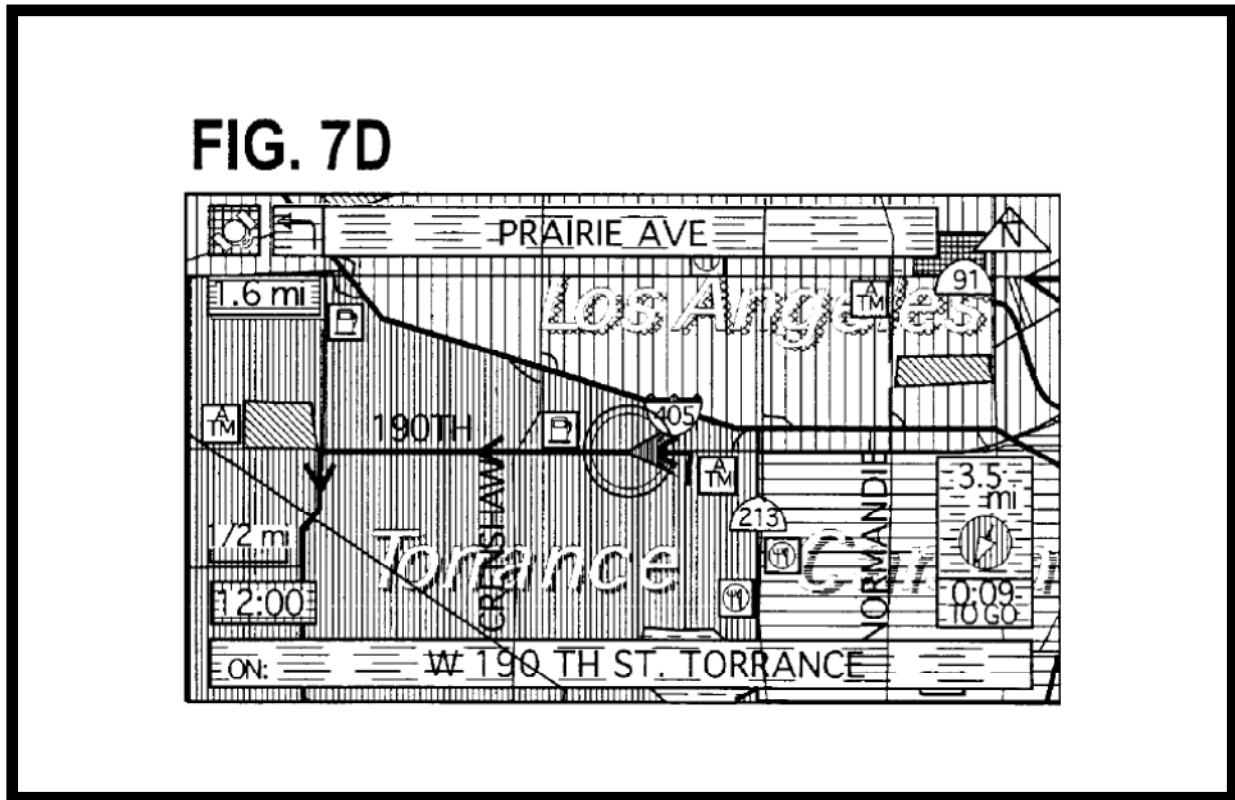
The map database 24 includes a road table 150 comprising information used to display roads in the navigation system. (*Id.* at 5:33-51.) The map database 24 also includes information for displaying cities, restaurants, gas stations, and the like on the map. (*Id.* at 4:42-5:32.)

To create a map display for a selected map scale, the display controller 16 draws a plurality of layers. (*Id.* at 11:1-4; *see also id.* at 10:51-67, 13:9-12.) The layers include: (i) roads that are displayable according to the saved road priority levels for the set map scale; (ii) display elements (*e.g.*, city names, point-of-interest icons, etc.) selected based on saved priorities; and (iii) a guidance route. (*Id.* at 9:8-16, 11:8-17; *see also id.* at 4:56-5:11, 5:22-26.) Figures 6C-F, shown below, illustrate several layers of the map display:



(*Id.* at FIGS. 6C-F.)

The display controller 16 then synthesizes all the layers into a single map display and sends the single map display to the display unit 20. (*Id.* at 11:1-4; *see also id.* at 10:51-67, 13:9-12.)



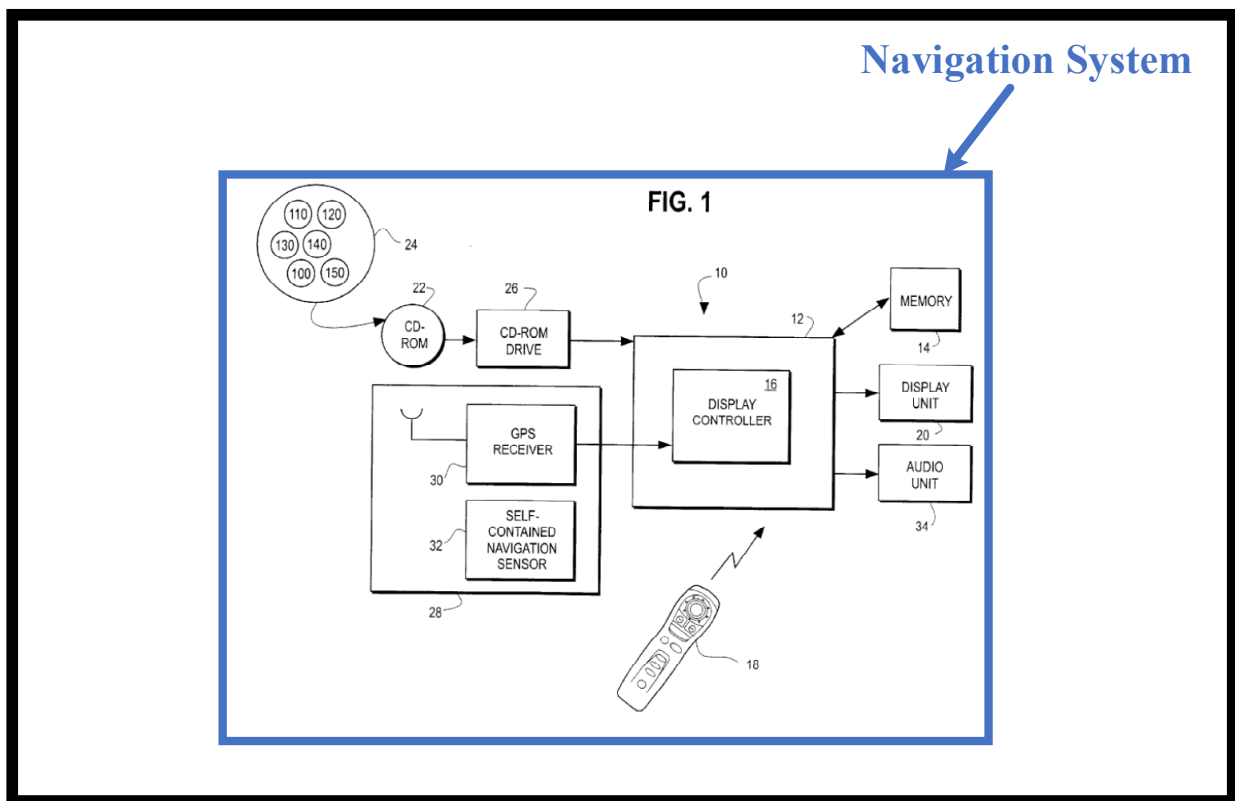
(*Id.* at FIG. 7D.)

Yokota is analogous art to the '465 patent because Yokota is in the same field of endeavor as the '465 patent: navigation systems. (EX1003, ¶86; EX1001 at 1:7-8, 1:43-50, 2:23-29; EX1005 at 4:19-30, 11:1-17, FIGS. 6A-H, FIGS. 7A-D.) Yokota is also analogous art to the '465 patent because Yokota is at least reasonably pertinent to a problem addressed by the '465 patent: displaying a guide route with no discontinuities. (*Id.*)

2. Yokota In Combination With The Knowledge Of A POSITA Renders Obvious Independent Challenged Claim 1.

(a) Yokota Discloses “A navigation system” (“Limitation [1-PRE]”).

To the extent the preamble of Challenged Claim 1 is limiting, Yokota discloses limitation [1-PRE]. Yokota discloses a “navigation system 10,” which is shown below. (EX1005 at 3:56-57, 4:19-20; *see also id.* at Abstract, 1:10-14, claim 23; EX1003, ¶101.)

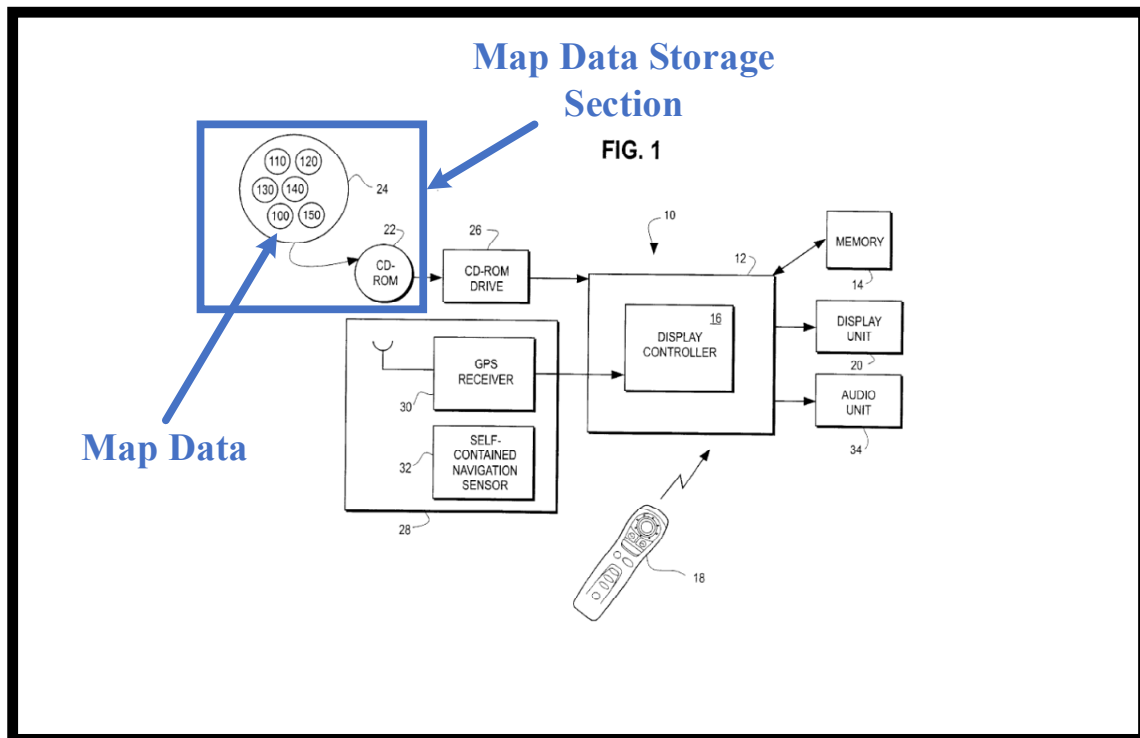


(EX1005 at FIG. 1 (annotated).)

- (b) Yokota Discloses “a map data storage section for storing map data together with attributes and classes of the map data, the map data being composed of roads necessary for a route search and display elements including city centers and facilities, and the city centers being a display element each representing a city and indicating a representative position of the city, wherein the attributes are indicative of whether or not each of the roads should be displayed for each of a plurality of map scales” (“Limitation [1a]”).

Yokota discloses limitation [1a].

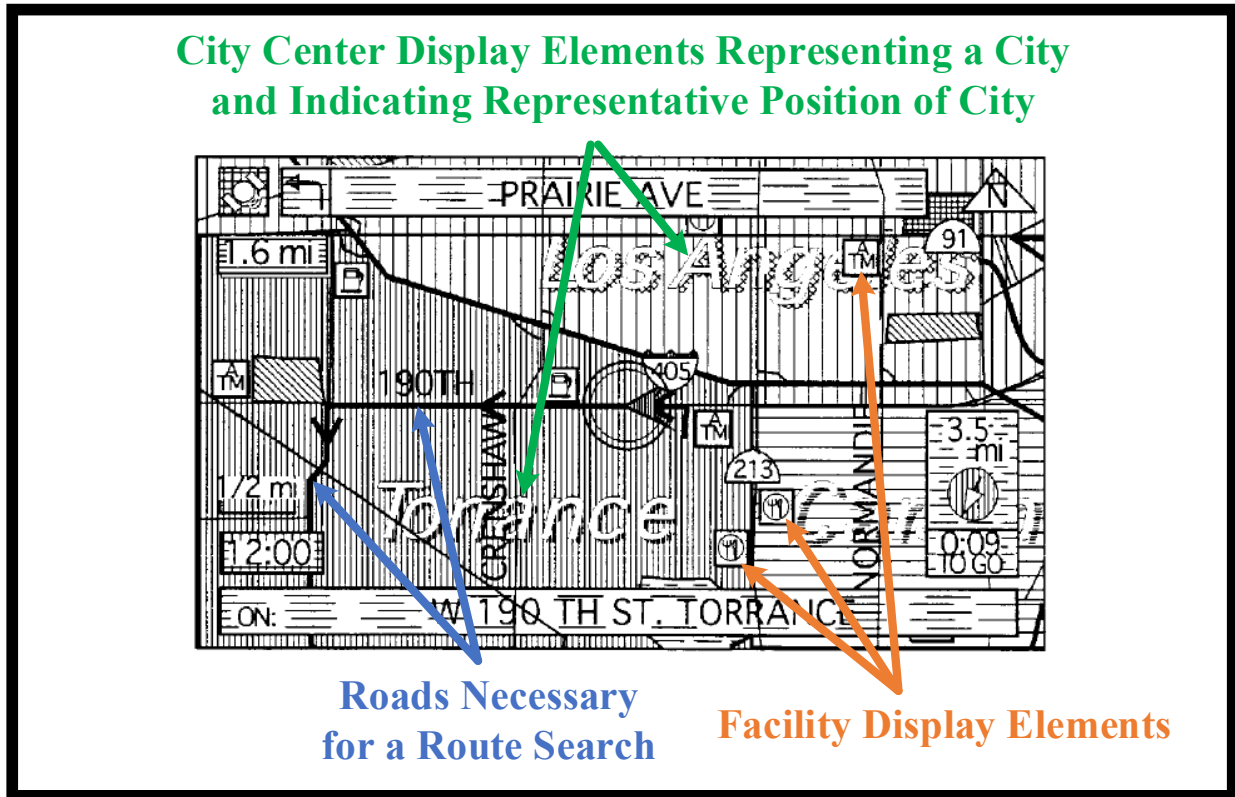
Yokota discloses “map data 24” that is stored on a CD-ROM 22 or, alternatively, “a DVD, a hard disk, a non-volatile memory chip,” or a similar storage device (*i.e.*, a map data storage section), as shown below. (EX1005 at 4:24-28, 4:33-36, 10:51-56; EX1003, ¶103.)



(EX1005 at FIG. 1 (annotated).)

Yokota also teaches that map data 24 includes a “road data table 150” which comprises the “road data” “used in displaying roads in the vehicle navigation system” (*i.e.*, the roads necessary for a route search). (EX1005 at 4:39-41, 5:33-51, 5:52-62, 12:44-53; *see also id.* at claims 1, 18, and 22; *id.* at FIGS. 6F, 7A-D (displaying roads from a route search); EX1003, ¶104.)

Yokota’s map data 24 also includes displayable names and icons (*i.e.*, display elements) for cities (*i.e.*, city centers), as well as locations for the names/icons to indicate the representative positions of the cities. (EX1005 at 2:59-64, 4:42-55, 4:56-5:11, 5:12-21, 5:22-32; *see also id.* at 12:44-53, claims 7-8, FIGS. 4A-D, 7A-D, 8A-D; EX1003, ¶105.) Map data 24 further includes displayable icons (*i.e.*, display elements) for malls, restaurants, gas stations, and the like (*i.e.*, facilities). (EX1005 at 4:42-45, 5:7-8, 10:6-21, 10:26-27; *see also id.* at 3:37-44, claim 20, FIGS. 4C-D, 7A-D, 8A-D; EX1003, ¶106.) Examples of roads and display elements in Yokota’s map data 24 are shown below:



(EX1005 at FIG. 7D (annotated).)

Yokota also teaches that its map data storage section stores, for each road in the road data table 150, a road type (*e.g.*, highway, major road, etc.) and a “priority” for the road based on the road type. (EX1005 at 5:33-51, 12:53-61, FIG. 10 (at reference numeral 206); *see also id.* at 6:61-7:3, claims 18 and 22; EX1003, ¶107.) Yokota teaches that there is preferably “at least one road priority level for each map scale level.” (EX1005 at 9:13-14, 12:53-13:3; EX1003, ¶107.) Yokota’s Table 3, which illustrates a “sample set of road priority levels, *i.e.* when to display certain roads” (*id.* at 9:15-16), is reproduced below:

TABLE 3

	Scale				
	Smallest	Small	Medium	Large	Largest
Inter-state	Shown	Shown	Shown	Shown	Shown
Major Hwys	Upgradable	Shown	Shown	Shown	Shown
Minor Hwys	Omitted	Upgradable	Shown	Shown	Shown
Major Roads	Omitted	Omitted	Upgradable	Shown	Shown
Minor Roads	Omitted	Omitted	Omitted	Upgradable	Shown

(EX1005 at 9:17-30 (Table 3).)¹

As shown above, Yokota’s road priority levels indicate whether or not each of the roads in the road data table 150 should be displayed for each of a plurality of map scales. (EX1005 at 9:8-14, 9:17-30; *see also id.* at Abstract, claims 18 and 22; EX1003, ¶109.) A POSITA would have understood that Yokota’s road priority levels are “attributes” indicative of whether or not each of the roads should be

¹ An “Upgradable” road priority level indicates that the road should not be displayed unless certain criteria are met (*e.g.*, the road is in a rural area where there are only a few higher-priority roads nearby). (EX1005 at FIG. 5, 9:33-10:5; EX1003, ¶109.)

displayed for each of a plurality of map scales. (EX1003, ¶109.) Notably, Yokota’s Table 3 is essentially identical to Figure 2 of the ‘465 patent, which “shows an example of the road attributes and classes to be stored in the map data storage section 5.” (EX1001 at FIG. 2, 4:1-3.)

Yokota further teaches that its map data storage section stores classes of the map data 24. (EX1003, ¶110.)

The map data storage section stores the “street class, *e.g.* freeway, highway, local, ramp, ferry route, etc.” for each of the roads in the road table 150. (EX1005 at 5:33-39; *see also id.* at 9:17-30 (Table 3), 12:44-53, claims 18, 20, and 22; EX1003, ¶110.)

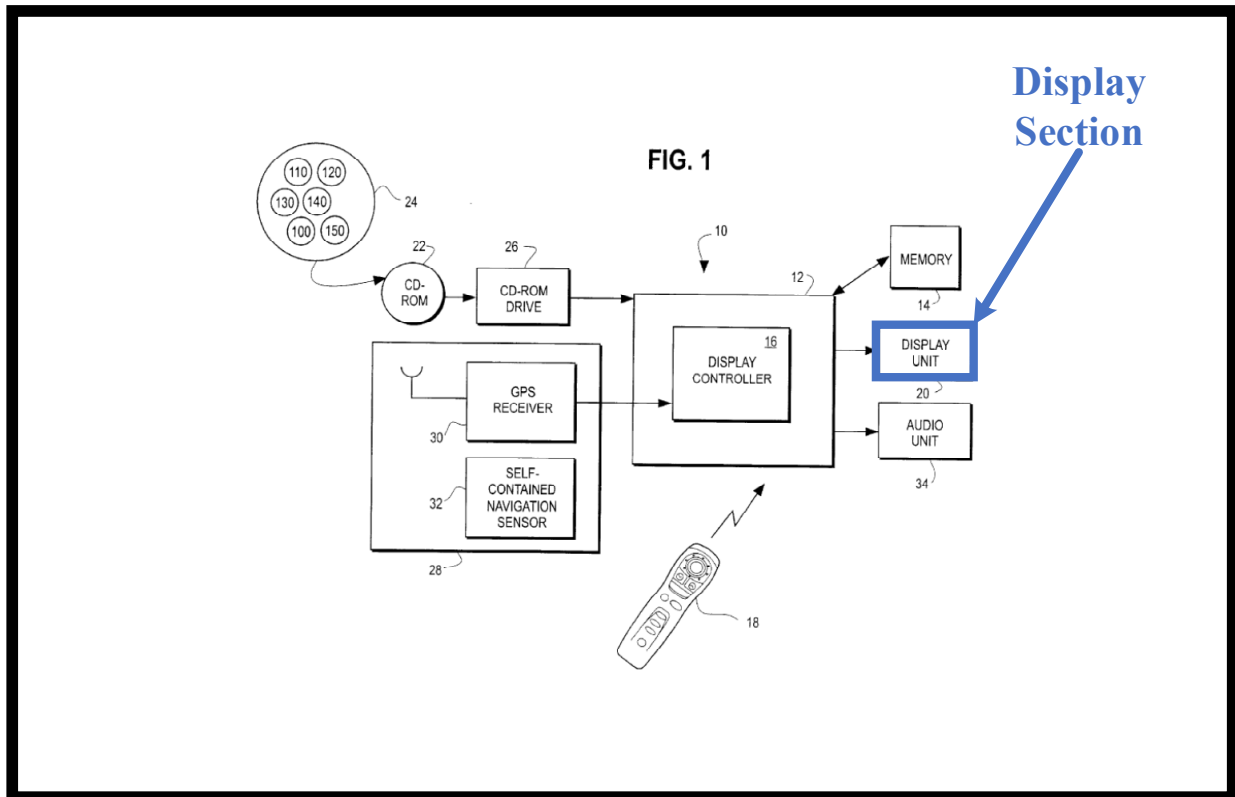
The map data storage section also stores the population and type (*e.g.*, large city, small city, etc.) for each of the city centers in the map data 24. (EX1005 at 5:1-7, 5:23-27, 7:15-25 (Table 1), 8:10-22, 8:26-34 (Table 2), 8:38-57, 12:44-53, claims 2, 5, and 7-8; EX1003, ¶111.)

The map data storage section also stores a service type (*e.g.*, restaurant, gas station, etc.) for each of the facilities in the map data 24. (EX1005 at 3:37-44, 10:6-21; *see also id.* at FIG. 6E (showing facility icons of different types); EX1003, ¶112.)

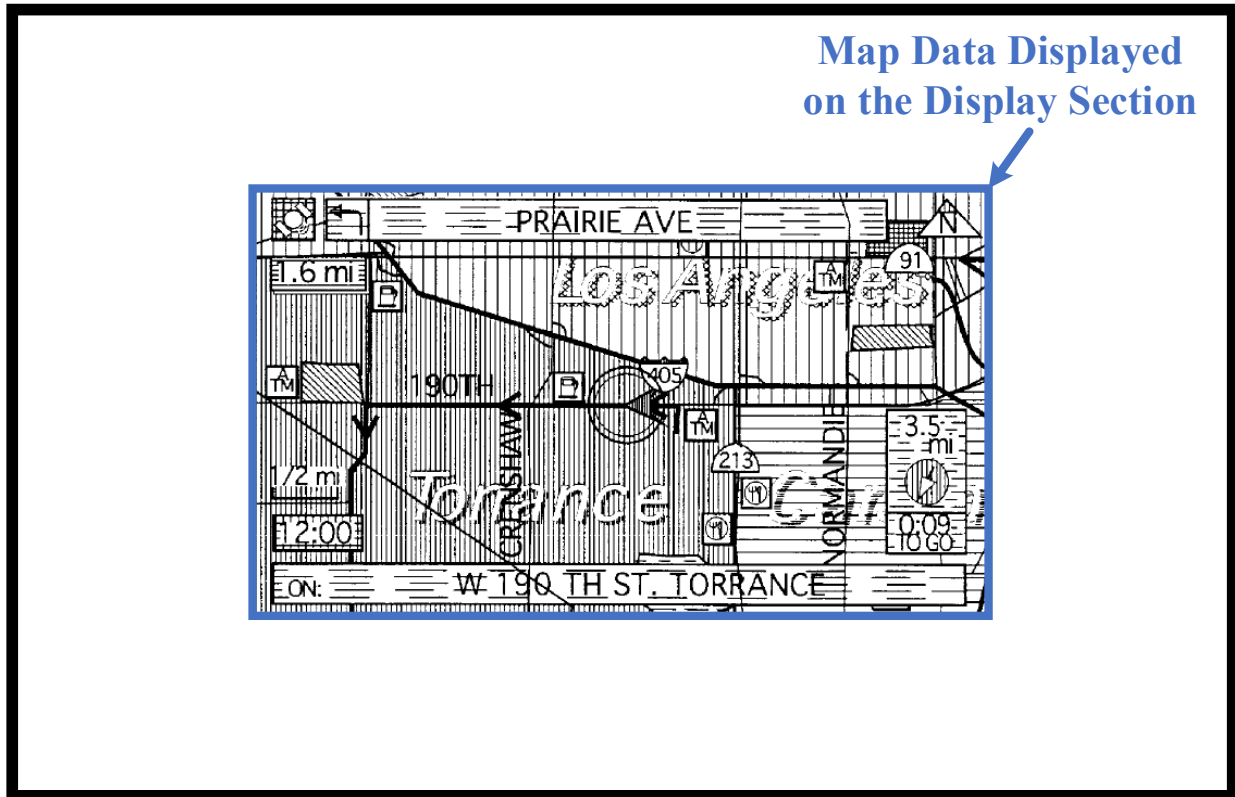
(c) Yokota Discloses “a display section for displaying the map data” (“Limitation [1b]”).

Yokota discloses limitation [1b].

Yokota discloses that navigation system 10 comprises a display unit 20 (*i.e.*, a display section) for displaying the map data 24. (EX1005 at 4:24, 6:40-44; *see also id.* at Abstract, 10:50-56, 11:1-4, 13:9-12; EX1003, ¶114.) Yokota's display section is shown below:



(EX1005 at FIG. 1 (annotated).)

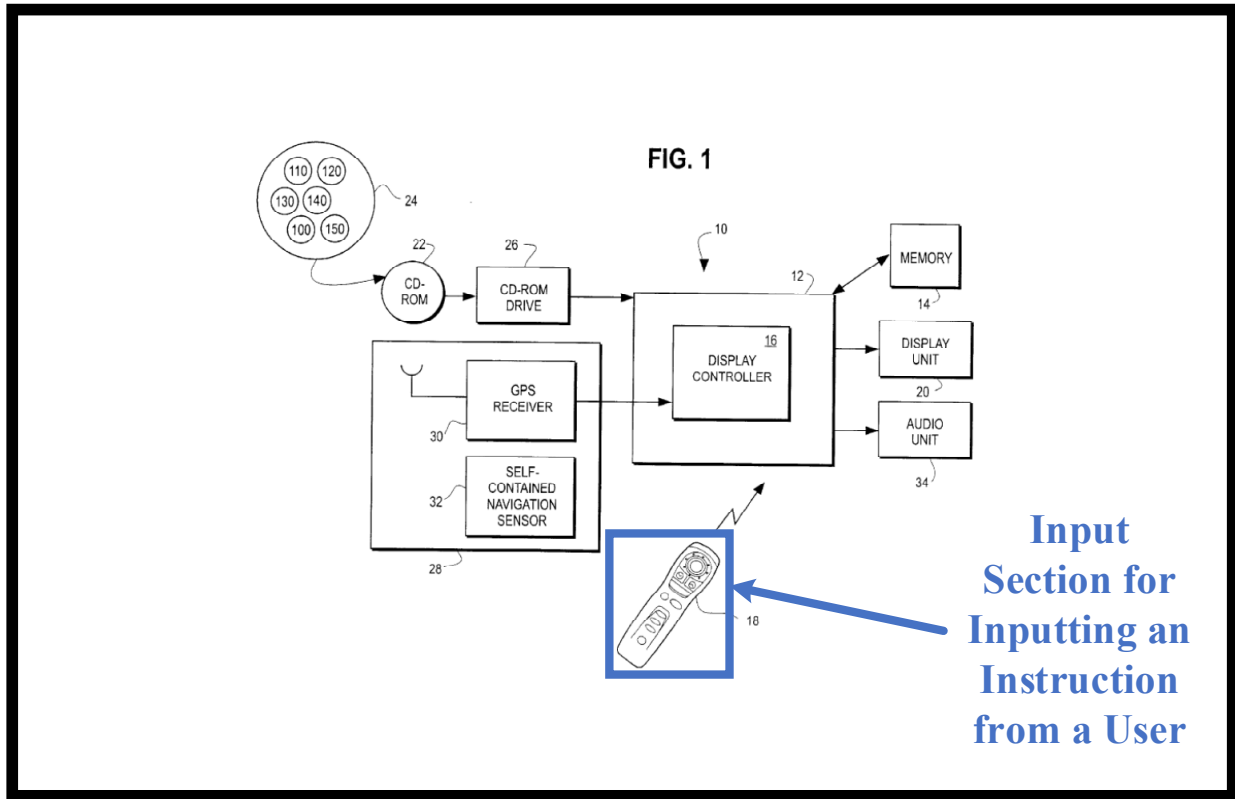


(*Id.* at FIG. 7D (annotated).)

(d) Yokota Discloses “an input section for inputting an instruction from a user” (“Limitation [1c]”).

Yokota discloses limitation [1c].

Yokota discloses that navigation system 10 comprises an input device 18 (*i.e.*, an input section), such as a remote controller. (EX1005 at 4:22-24, 6:2-4; EX1003, ¶116.) The input device 18 is configured to input driver instructions, such as instructions to “zoom in” or “zoom out” on the displayed map. (EX1005 at Abstract, 3:49-53, 6:9-14, 13:3-4; EX1003, ¶117.) An example of Yokota’s input section is shown below:



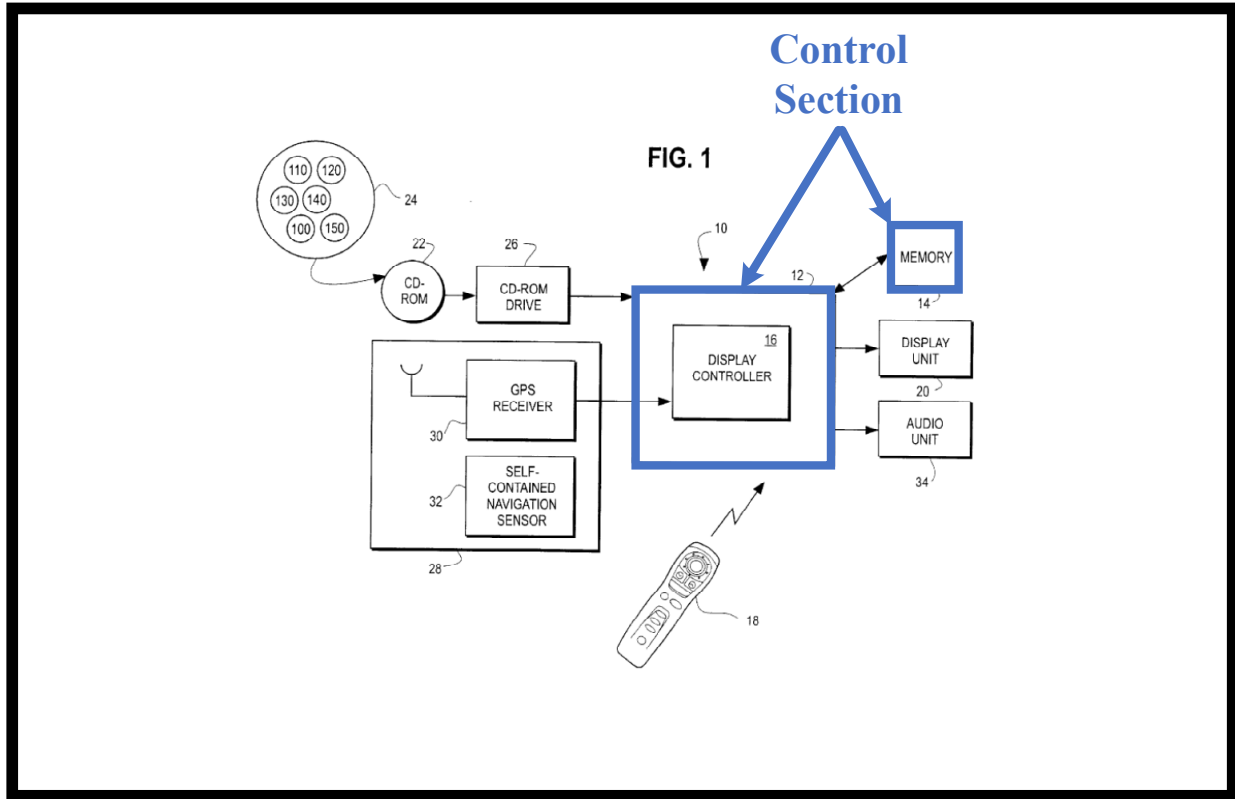
(EX1005 at FIG. 1 (annotated).)

(e) Yokota Discloses “a control section for carrying out” (“Limitation [1d]”).

Yokota discloses limitation [1d].

Yokota discloses that navigation system 10 comprises a microprocessor 12 with an associated memory 14 (collectively, a control section). (EX1005 at FIG. 1,

4:19-21, claim 23; EX1003, ¶119.)² As discussed in detail below, Yokota's control section carries out various procedures. Yokota's control section is shown below:



(EX1005 at FIG. 1 (annotated).)

² Patent Owner has confirmed that a microprocessor with an associated memory reads on the claimed “control section.” (EX1001 at 4:26-28; EX1026 at 91; EX1027 at 108.)

- (f) **Yokota In Combination With The Knowledge Of A POSITA Teaches And Renders Obvious “a procedure of calculating a route between an own-vehicle position and a destination represented by one of the display elements, the destination being instructed via the input section” (“Limitation [1e]”).**

Yokota in combination with the knowledge of a POSITA teaches and renders obvious limitation [1e].

Yokota teaches a procedure of calculating a guidance route “to a desired destination.” (EX1005 at 1:16-25, 11:18-22; *see also id.* at 11:8-17; EX1003, ¶122.) While Yokota does not expressly identify where the calculated guidance route begins, a POSITA would have found it obvious to begin the calculated guidance route at the present position of the vehicle (*i.e.*, an own-vehicle position). (EX1003, ¶123.) Prior to the alleged invention of the ‘465 patent, it was common for vehicle-based navigation systems such as Yokota’s navigation system 10 to calculate a route from the vehicle’s current position to a driver-specified destination. (*Id.*) A POSITA would have been motivated to begin Yokota’s calculated guidance route at the vehicle’s current position: (i) to increase driver convenience by eliminating the need for the driver to manually enter a route starting point; (ii) to simplify the route guidance process for the driver by placing the driver’s vehicle on the guidance route immediately once the destination is entered; and (iii) to prevent driver confusion when the driver’s current position differs from the route starting point (*e.g.*, where

the driver does not know how to get from his or her current position to the route starting point). (*Id.*)

Yokota's teaching that microprocessor 12 determines the present position of the vehicle is consistent with, and supports, beginning the calculated route at an own-vehicle position. (EX1005 at 1:16-25, 10:50-56; EX1003, ¶124.)

U.S. Patent No. 5,852,791 ("Sato"), which is incorporated by reference in Yokota, further supports that a calculated guidance route begins at an own-vehicle position. (EX1005 at 11:18-22; EX1006 at 10:14-17.)

A POSITA would have understood that Yokota's microprocessor 12 (*i.e.*, control section) performs the procedure of calculating a route between an own-vehicle position and a destination because: (i) Yokota expressly teaches that microprocessor 12 receives vehicle position information from location system 28 and generates a map display (including a guidance route) using the position information; and (ii) navigation systems typically used a microprocessor such as Yokota's microprocessor 12 to perform route calculation functions. (EX1003, ¶126; EX1005 at 10:50-56, 11:8-17; EX1006 at FIG. 4, 10:14-17, 10:34-38; EX1014 at 8:21-29.) Sato, which is incorporated by reference in Yokota, further supports that Yokota's microprocessor 12 performs the procedure of calculating a route between an own-vehicle position and a destination. (EX1006 at FIG. 4, 10:14-17, 10:34-38.)

A POSITA would also have found it obvious to input the destination using Yokota's input device 18 (*i.e.*, input section). (EX1003, ¶128.) Prior to the alleged invention of the '465 patent, using an input device (*e.g.*, a keypad, microphone, touchscreen, etc.) to input a destination into a navigation system was routine and ubiquitous in the art as it allowed drivers to specify where they would like to go. (*Id.*) Yokota teaches guiding a driver to a "desired destination" (EX1005 at 1:16-25), and a POSITA would have been motivated to input a destination using Yokota's input device 18 to allow the driver to specify his or her desired destination and because Yokota's navigation system 10 would not know where the driver wants to go without the driver's input. (EX1003, ¶128; *see also* EX1005 at 4:22-24 (teaching that input device 18 is responsible for accepting driver input).) Sato, which is incorporated by reference in Yokota, further supports that the destination would be input using Yokota's input device 18. (EX1006 at 7:61-64 (disclosing a remote controller 2 used to set a guide route to a destination); *see also id.* at 1:11-13, 10:14-15.)

A POSITA would also have found it obvious to represent the driver-input destination with a display element. (EX1003, ¶130.) Prior to the alleged invention of the '465 patent, it was common for displayed guidance routes to end at a display element representing the driver's destination (*e.g.*, a star, a checkered flag, etc.).

(*Id.*)³ A POSITA would have known that displaying a guidance route that ends abruptly could confuse the driver. (*Id.*) A POSITA would have been motivated to represent the destination set by the driver with a display element to beneficially provide a clear visual demarcation of the end of the guidance route and to help the driver find his or her destination (*e.g.*, by showing which side of the road the destination is on). (*Id.*) A POSITA would have had a reasonable expectation of success because the proposed modification would have required a routine, straightforward adjustment to Yokota’s map data 24 (*e.g.*, adding a checkered flag icon to represent a destination) and Yokota already discloses placing icons at representative positions on a map. (*Id.*; EX1005 at FIG. 7D.)⁴

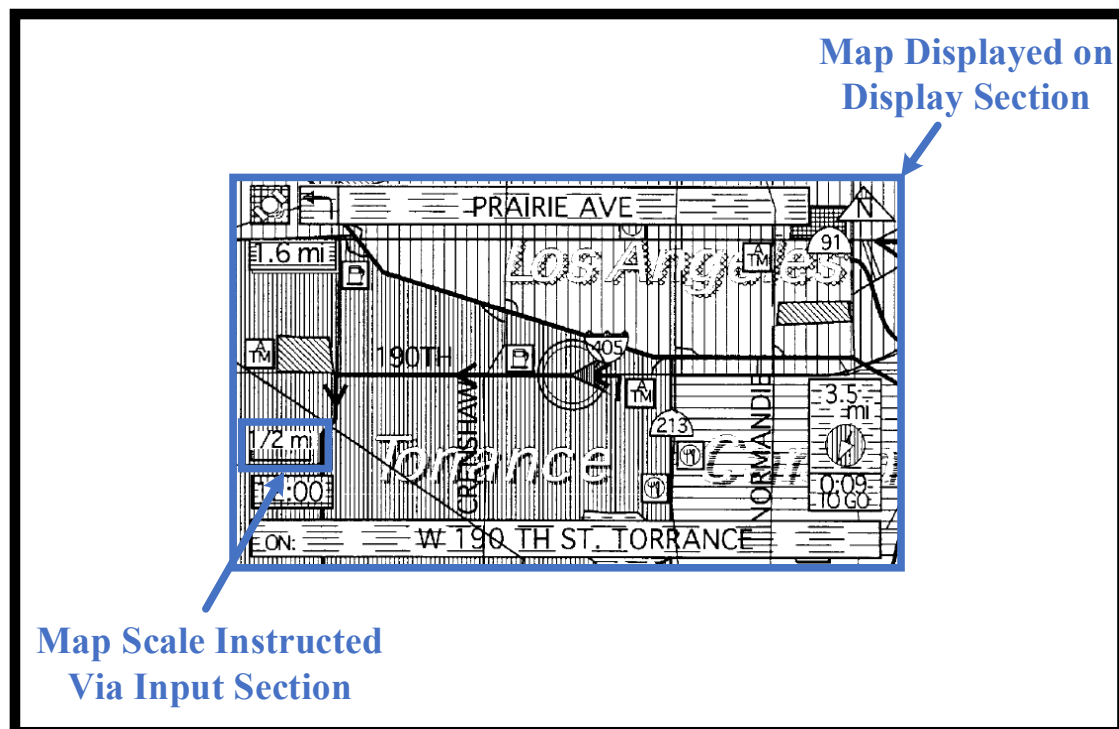
³ Patent Owner has asserted in related district court proceedings involving the ‘465 patent that a checkered flag or a red pin reads on the claimed “destination represented by one of the display elements.” (EX1026 at 36-37; EX1027 at 37-38.)

⁴ The ‘465 patent provides no technical detail regarding beginning a route at a current vehicle location, inputting a destination using an input device, or representing a destination with a display element (*see, e.g.*, EX1001 at 4:53-56, 5:11-15, 6:3-9), which supports that each would have been conventional for a POSITA to implement. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).

- (g) **Yokota Discloses “in accordance with one of the plurality of map scales instructed via the input section, a procedure of displaying a map on the display section” (“Limitation [1f]”).**

Yokota discloses limitation [1f].

Yokota discloses that display controller 16, which is part of microprocessor 12 (*i.e.*, the control section), performs a procedure of displaying a map on display unit 20 (*i.e.*, the display section). (EX1005 at 6:40-46, 10:51-11:4, 13:9-12; *see also id.* at Abstract, claim 23; EX1003, ¶133.) Yokota teaches that the map is displayed on the display unit 20 in accordance with one of a plurality of map scales input via input device 18 (*i.e.*, the input section), as shown below. (EX1005 at 1:35-43, 6:9-14, 10:51-67; *see also id.* at Abstract, claim 22; EX1003, ¶134.)



(*Id.* at FIG. 7D (annotated).)

(h) Yokota Alone Discloses, Or Yokota In Combination With The Knowledge Of A POSITA Renders Obvious, “selecting the roads indicated by the attributes as being displayable according to the instructed map scale, and by selecting the display elements based on ranks” (“Limitation [1g]”).

Yokota alone discloses, or Yokota in combination with the knowledge of a POSITA renders obvious, limitation [1g].

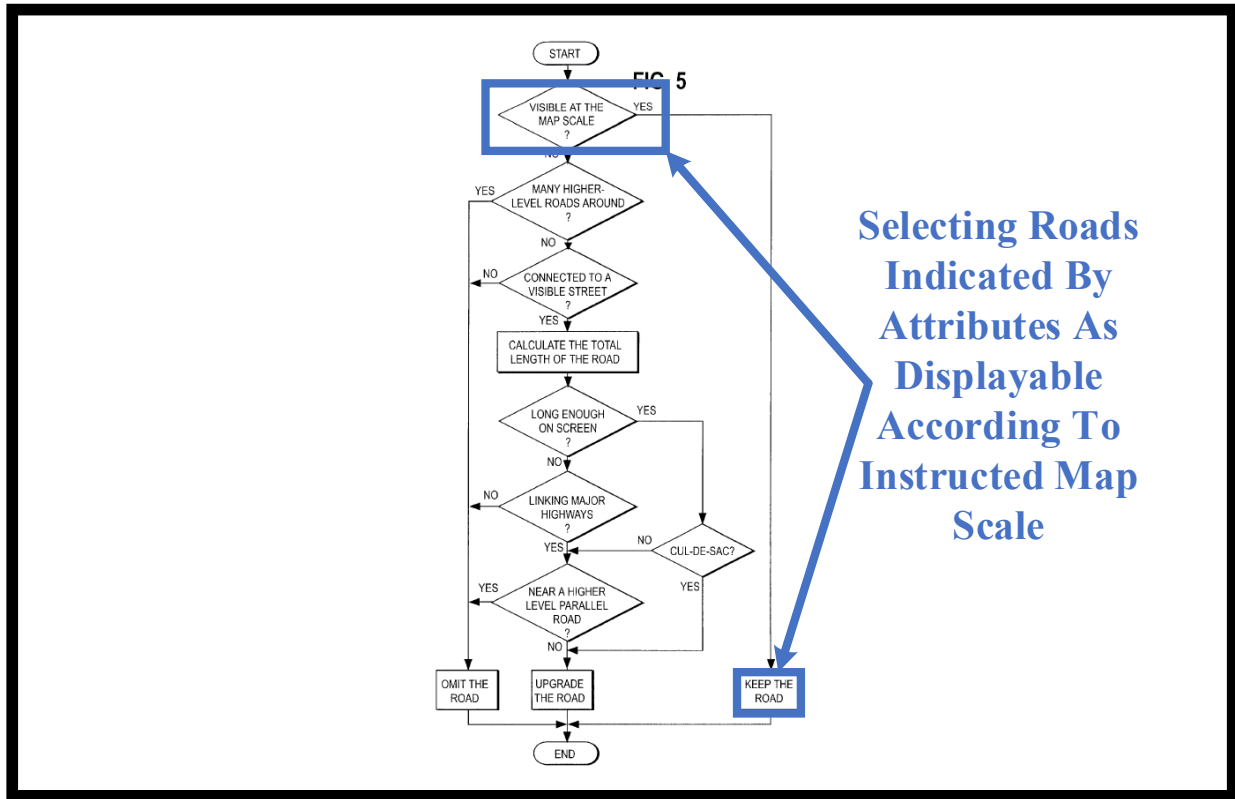
As discussed above with respect to limitation [1a], Yokota discloses storing attributes indicative of whether or not each of the roads in the map data 24 should be displayed for each of a plurality of map scales. (EX1005 at 5:33-51, 9:8-30, 12:53-61, FIG. 10 (at reference numeral 206); EX1003, ¶136.)

Yokota also discloses that the display controller 16 selects the roads indicated by the attributes as being displayable according to the instructed map scale and draws them as a layer. (EX1005 at 9:8-30, 11:1-17; *see also id.* at Abstract (“The apparatus selectively displays or does not display any given road based on both display scale and the importance, or priority, of the road.”), FIG. 5, FIG. 6D, 10:51-67; EX1003, ¶137.) For instance, in the example shown in Table 3, all road types are selected when the driver sets the map scale to the “largest” scale because the road priority levels (*i.e.*, attributes) indicate that all road types are displayable at that scale. (EX1005 at 9:8-30; EX1003, ¶137.) This is shown further in Table 3 and Figures 5 and 6D below:

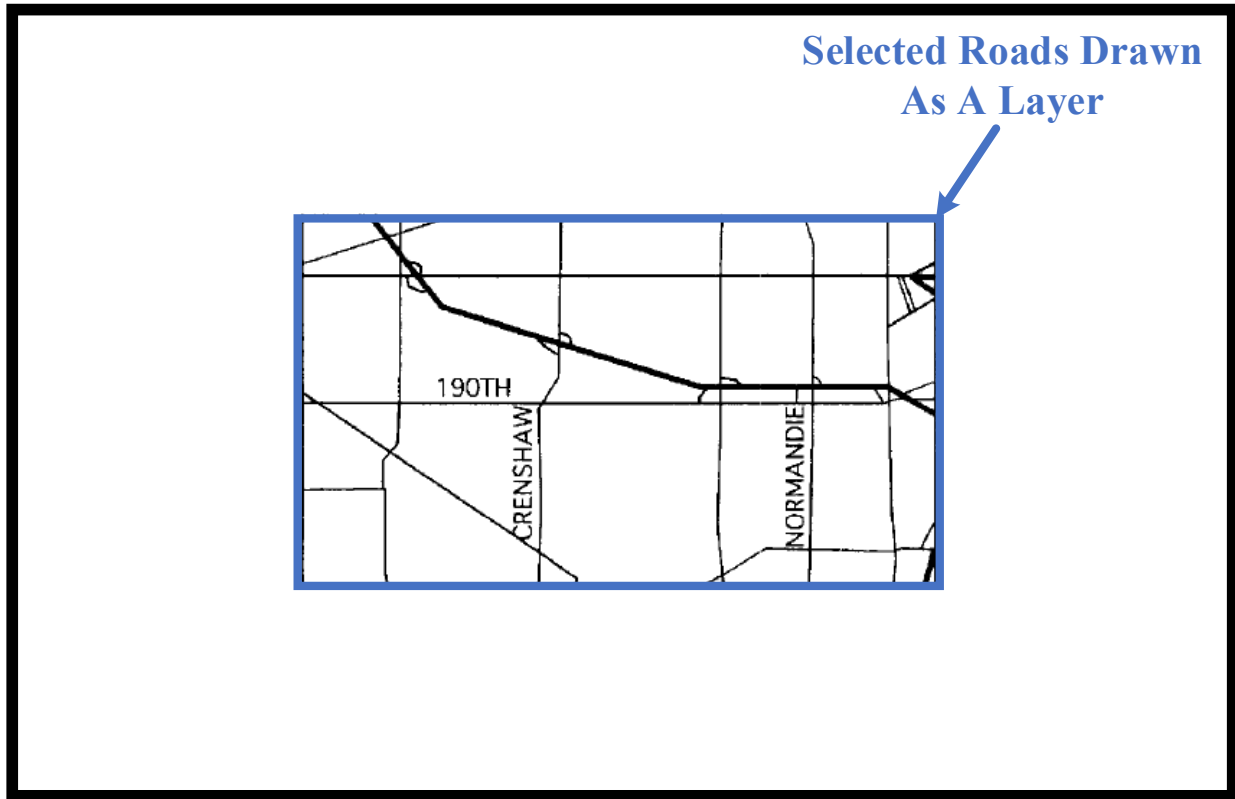
TABLE 3

	Scale				
	Smallest	Small	Medium	Large	Largest
Inter-state	Shown	Shown	Shown	Shown	Shown
Major Hwys	Upgradable	Shown	Shown	Shown	Shown
Minor Hwys	Omitted	Upgradable	Shown	Shown	Shown
Major Roads	Omitted	Omitted	Upgradable	Shown	Shown
Minor Roads	Omitted	Omitted	Omitted	Upgradable	Shown

(EX1005 at 9:17-30 (Table 3).)



(EX1005 at FIG. 5 (annotated).)

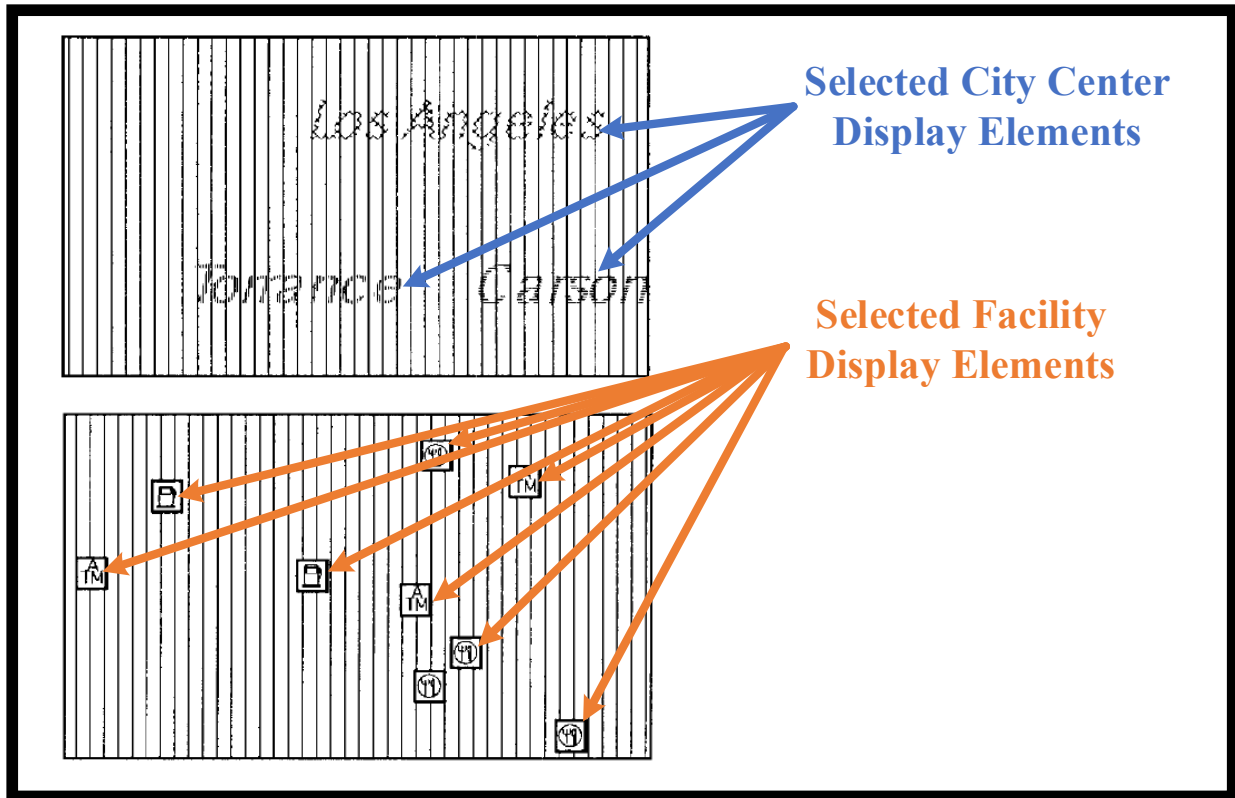


(*Id.* at FIG. 6D (annotated).)

Yokota further teaches that the display controller 16 selects city center and facility display elements based on their priorities (*i.e.*, ranks)⁵ and draws them as

⁵ The specification of the ‘465 patent uses the term “rank” synonymously with the term “priority.” (*Compare* EX1001 at 6:33-36 (“the route without having the attributes to be displayed on the map scale can be displayed in a distinct manner such as using dotted lines so as to indicate that these roads have lower ranks.”) *with* EX1005 at 9:41-44 (“The upgraded road may be displayed with a slightly adjusted color (e.g. lighter) and/or a line style (e.g. dotted) to indicate its lower priority.”).)

layers as shown below. (EX1005 at 4:56-5:11, 5:22-26, 7:12-25 (Table 1), 8:23-35 (Table 2); *see also id.* at Abstract, 2:59-64, 3:30-36, 3:37-44, 10:6-21, 11:1-17, 12:61-13:1, FIGS. 6C and 6E; EX1003, ¶138.)



(EX1005 at FIGS. 6C and 6E (annotated).)

A POSITA also would have found it obvious to select Yokota's city center and facility display elements based on ranks. (EX1003, ¶139.) Prior to the alleged invention of the '465 patent, it was well-known in the art for navigation systems to use ranks to determine which display elements to display on a map. (*Id.*) Ranks were commonly used to minimize the amount of information displayed on the map

(thus reducing clutter and making the map easier to read) while ensuring that the most relevant display elements are shown for the selected map scale. (*Id.*)

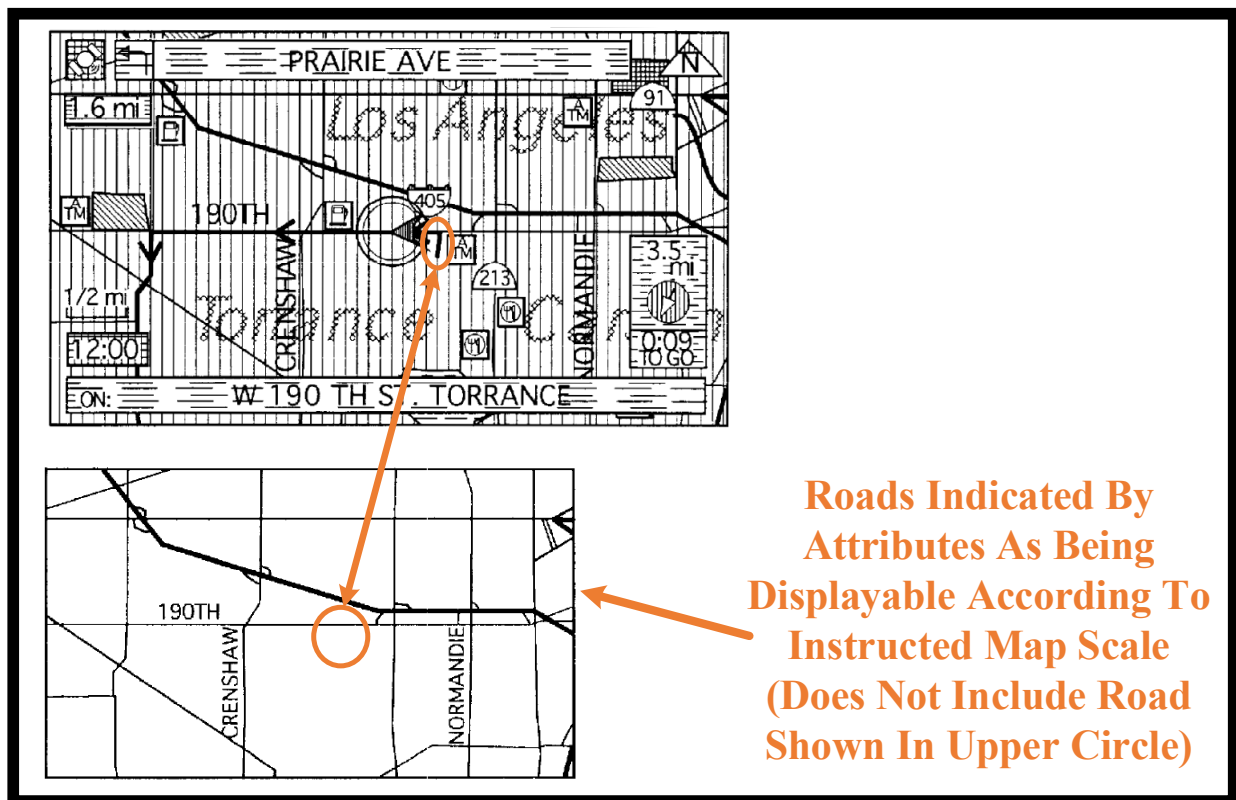
A POSITA would have been motivated to modify Yokota to select city center and facility display elements based on ranks to: (i) reduce map clutter and make the map easier to read, (ii) prevent display elements from overlapping with each other and with the displayed roads, and (iii) ensure that the most relevant display elements are shown for the selected map scale. (*Id.*, ¶140.) The proposed combination would have been consistent with Yokota’s express goals of avoiding overlapping information and clutter and presenting the most important information to the driver. (*Id.*; EX1005 at Abstract, 3:30-44, 10:22-26.)⁶

- (i) **Yokota Discloses And Suggests “further selecting each of the roads that is part of the calculated route but not indicated by the attributes as being displayable according to the instructed map scale” (“Limitation [1h]”).**

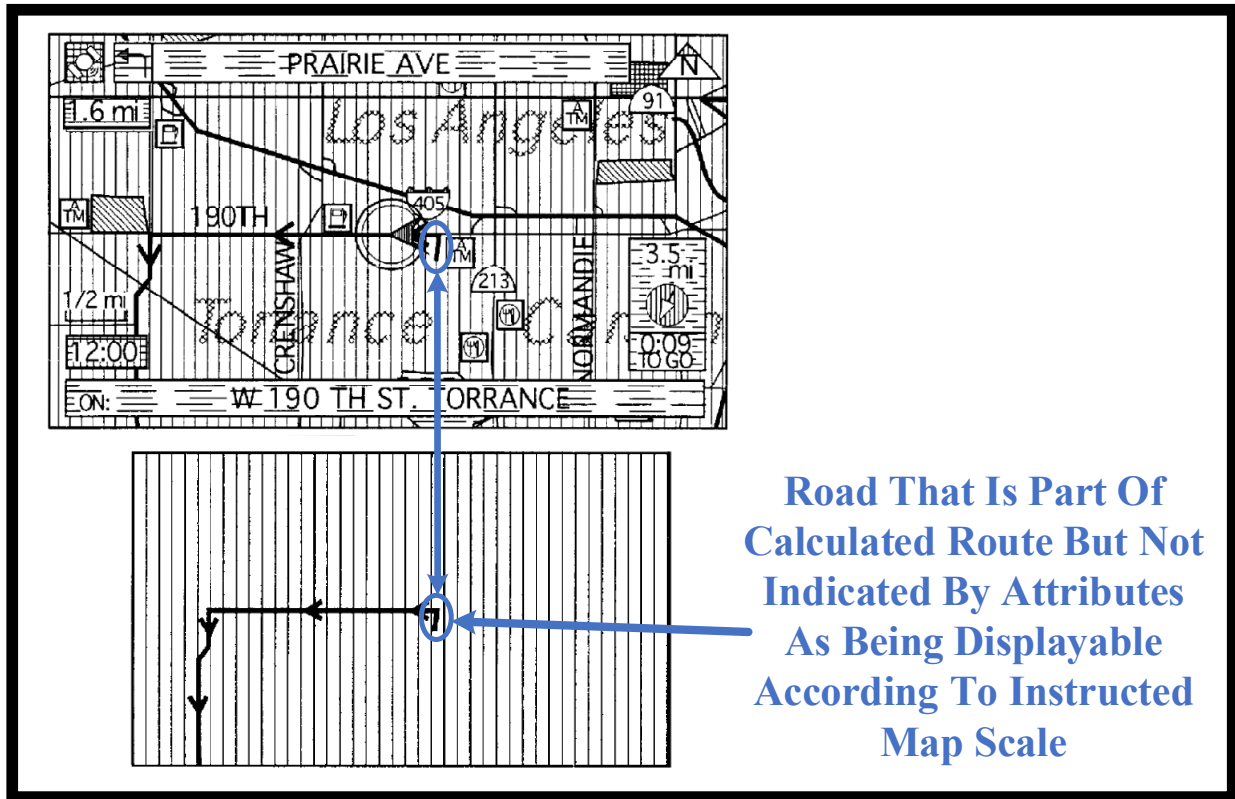
Yokota discloses and suggests limitation [1h].

⁶ The ‘465 patent provides no technical detail regarding selecting display elements based on ranks (*see, e.g.*, EX1001 at 3:5-10, 4:30-34, 8:4-8), which supports that doing so would have been conventional for a POSITA to implement. *In re Buchner*, 929 F.2d at 661.

Yokota discloses that after the layers containing the displayable roads and the selected display elements have been drawn, the display controller 16 draws a layer containing the calculated “guidance route.” (EX1005 at 11:8-17; *see also id.* at FIGS. 6A-F; EX1003, ¶143.) As shown below, Yokota discloses that the layer containing the calculated guidance route includes the roads that are part of the calculated route but are not indicated by the attributes as being displayable according to the instructed map scale. (EX1003, ¶144.)



(*Id.*)



(*Id.*)

Yokota’s teaching that “a guidance route” is displayed (as opposed to “a portion of a guidance route,” “the displayable portions of a guidance route,” *etc.*), along with Yokota’s figures reproduced above, also at least suggests that the layer containing the calculated guidance route includes *all* roads that are part of the calculated guidance route—including any roads that are part of the calculated guidance route but not indicated by the attributes as being displayable according to the instructed map scale. (EX1003, ¶145; EX1005 at 11:8-17, FIGS. 6F and 7A-D.)

A POSITA would also have understood that, to draw a layer containing the roads that are part of the calculated route but not indicated by the attributes as being

displayable according to the instructed map scale, the display controller 16 must first select the roads to be drawn. (EX1003, ¶146; EX1005 at Abstract, FIG. 5, 9:8-30, 11:1-17 (disclosing that the display controller 16 selects the roads that are displayed).)

(j) Yokota Discloses “displaying the selected roads and the selected display elements on the display selection as part of the map” (“Limitation [1i]”).

Yokota discloses limitation [1i].

Yokota discloses that the display controller 16 synthesizes the layers containing the selected roads and display elements “into a single map display” that is sent to the display unit 20 (*i.e.*, the display section). (EX1005 at 11:1-4, 11:15-17; EX1003, ¶149.) The selected roads and display elements are then displayed on the display unit 20 as part of the displayed map. (*Id.*; *see also* EX1005 at Abstract, FIGS. 7A-D, 11:23-27, 13:9-12.)

3. Challenged Claim 2.

Yokota discloses and suggests the additional limitations of Challenged Claim 2 (*i.e.*, displaying each selected road not indicated by the attributes as being displayable in a different way from the other selected roads).

Yokota’s display controller 16 (which is part of the control section) displays each selected road not indicated by the attributes as being displayable according to the instructed map scale on the display unit 20 (*i.e.*, the display section) in a fashion

different from the other selected roads. (EX1003, ¶151; EX1005 at 11:1-17, FIGS. 6D, 6F, and 7D.) The selected roads not indicated by the attributes as being displayable according to the instructed map scale are displayed using a thick line, while the other selected roads are displayed using either a thin line or a thick line superimposed over a thin line. (*Id.*)

Yokota also discloses that upgradable roads “may be displayed with a slightly adjusted color (e.g. lighter) and/or a line style (e.g. dotted) to indicate [their] lower priority.” (EX1005 at 9:41-44.) An “upgradable” road is a road that should not be displayed at a certain map scale unless certain criteria are met. (*Id.* at FIG. 5, 9:33-10:5; EX1003, ¶152.) Yokota thus suggests displaying the selected roads not indicated by the attributes as being displayable according to the instructed map scale in a different fashion from the other selected roads. (EX1003, ¶152.)

4. Challenged Claim 3.

Yokota in combination with the knowledge of a POSITA teaches and renders obvious the additional limitations of Challenged Claim 3 (*i.e.*, performing route calculation under a condition recommended by navigation or input by the user through the input section).

As discussed above with respect to limitation [1e], Yokota in combination with the knowledge of a POSITA teaches and renders obvious performing a route

calculation between an own-vehicle position and a selected display element (*e.g.*, a star or checkered flag representing a destination). (EX1003, ¶155.)

Prior to the alleged invention of the ‘465 patent, it was well-known in the art to calculate a guidance route according to a condition recommended by the navigation system (*e.g.*, a route that minimizes time and/or distance) or according to a driver-input condition (*e.g.*, avoid tollways). (*Id.*, ¶156.) A POSITA would have been motivated to have Yokota’s navigation system calculate a route according to a condition recommended by the navigation system (*e.g.*, minimizing time and/or distance) to ensure that the driver is recommended the fastest and/or shortest (or otherwise most preferable) route that is available. (*Id.*, ¶157.) A POSITA also would have been motivated to have Yokota’s navigation system calculate a route according to a driver-input condition to beneficially allow the driver to incorporate his or her preferences into the calculation of the most preferred route (*e.g.*, a preference for avoiding tollways) or, if the driver does not like the suggested route, to help the system calculate an acceptable route. (*Id.*, ¶158.)

A POSITA would have had a reasonable expectation of success as algorithms for calculating a fastest and/or shortest route (optionally in accordance with driver preferences) were well-known and well understood prior to the alleged invention of the ‘465 patent, and these functions came standard in prior art navigation systems.

(*Id.*, ¶159; *see also* EX1001 at 6:13-15, 7:34-36 (discussing calculating a route using the well-known Dijkstra method).)

5. Yokota In Combination With The Knowledge Of A POSITA Renders Obvious Independent Challenged Claim 5.

- (a) **Yokota Discloses “A display method of a road network in a navigation system having a map data storage section for storing map data, which is composed of roads necessary for a route search and display elements including city centers and facilities, together with attributes and classes of the map data, the attributes being indicative of whether or not each of the roads should be displayed for each of a plurality of map scales, the navigation system also having a position information acquiring section for obtaining position information on a vehicle, a control section including a drawing memory, an input section for inputting an instruction from a user, and a display section for displaying the map data, the display method of the road network in the navigation system comprising” (“Limitation [5-PRE]”).**

Yokota discloses limitation [5-PRE].

Limitation [5-PRE] combines limitations [1-PRE] through [1d]. The only material differences between limitation [5-PRE] and limitations [1-PRE] through [1d] are that limitation [5-PRE] additionally requires:

- (i) “a display method of a road network”;
- (ii) “a position information acquiring section for obtaining position information on a vehicle”; and
- (iii) “a drawing memory.”

As shown above, Yokota discloses limitations [1-PRE] through [1d] and, therefore, limitation [5-PRE] (with the exception of the aforementioned three differences).

As shown below, Yokota also discloses each of the three differences between limitation [5-PRE] and limitations [1-PRE] through [1d].

First, Yokota discloses a “display method of a road network.” (EX1005 at Abstract, 10:51-59, 11:1-17, 11:23-27, 13:9-12, FIGS. 7A-D; EX1003, ¶164.)

Second, Yokota discloses a “position information acquiring section for obtaining position information on a vehicle.” Yokota discloses that navigation system 10 has a location system 28 for obtaining a vehicle’s position. (EX1005 at FIG. 1, 4:28-30, 6:24-37, 10:50-51, 11:23-27, 13:7-9; EX1003, ¶165.)

Third, Yokota discloses a control section including a “drawing memory.” (EX1003, ¶¶166-167.) Yokota teaches that microprocessor 12 includes a display controller 16 and an associated memory 14. (EX1005 at FIG. 1, 4:19-22, 6:45-46.) A POSITA would have understood that Yokota’s microprocessor 12 uses memory to store all the drawn map data elements (*i.e.*, a drawing memory) that are displayed on the display section via the display controller 16. (EX1003, ¶166.)

Yokota teaches that microprocessor 12, using display controller 16, draws map data using a plurality of layers that are synthesized together into a display.

(EX1005 at 11:1-17; *see also id.* at 10:51-59, 11:23-27, 13:9-12, FIGS. 6A-H; EX1003, ¶167.) A POSITA would have understood that, to synthesize layers of drawn map data in a state ready to be sent to the display unit 20, the drawn map data must be stored. (EX1003, ¶167.) Accordingly, a POSITA would have understood that Yokota's microprocessor 12 has memory that is used to store all the drawn map data elements (*i.e.*, a drawing memory) that are displayed on the display section. (*Id.*)

(b) Yokota In Combination With The Knowledge Of A POSITA Teaches And Renders Obvious “calculating a route between an own-vehicle position and a destination represented by one of the display elements, the destination being instructed by the user via the input section” (“Limitation [5a]”).

There are no material differences between limitation [5a] and limitation [1e]. (EX1011.) Thus, for the same reasons discussed above with respect to limitation [1e], Yokota in combination with the knowledge of a POSITA teaches and renders obvious limitation [5a].

(c) Yokota Discloses “drawing, according to one of a plurality of map scales designated by the user via the input section, a map on the drawing memory by” (“Limitation [5b]”).

Yokota discloses limitation [5b].

As discussed above with respect to limitation [1f], Yokota discloses drawing a map according to a map scale designated by the driver via the input device 18 (*i.e.*,

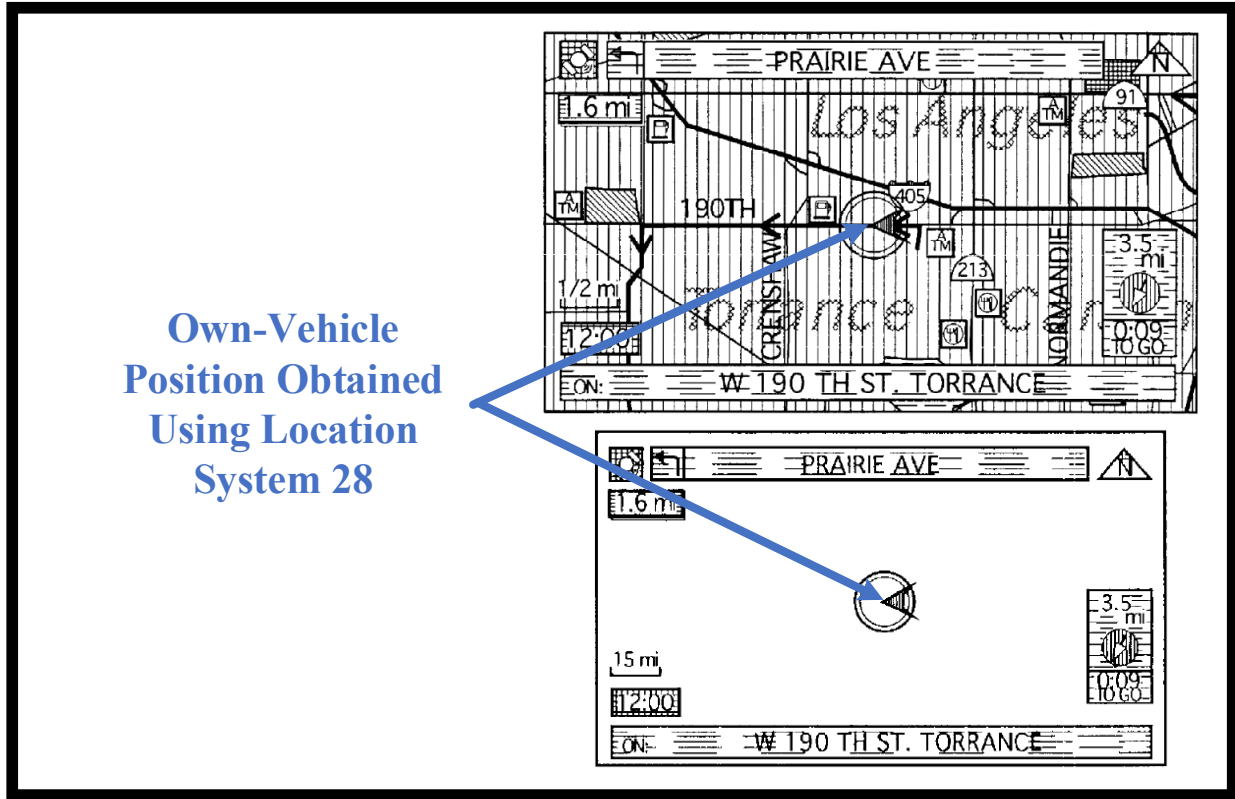
the input section). (EX1005 at 6:9-14, 10:51-11:17; *see also id.* at Abstract, 1:35-43, 13:9-12, claim 22; EX1003, ¶172.)

As also discussed above with respect to limitation [5-PRE], a POSITA would have understood that Yokota’s map is drawn on a drawing memory. (EX1003, ¶¶166-167, 173.)

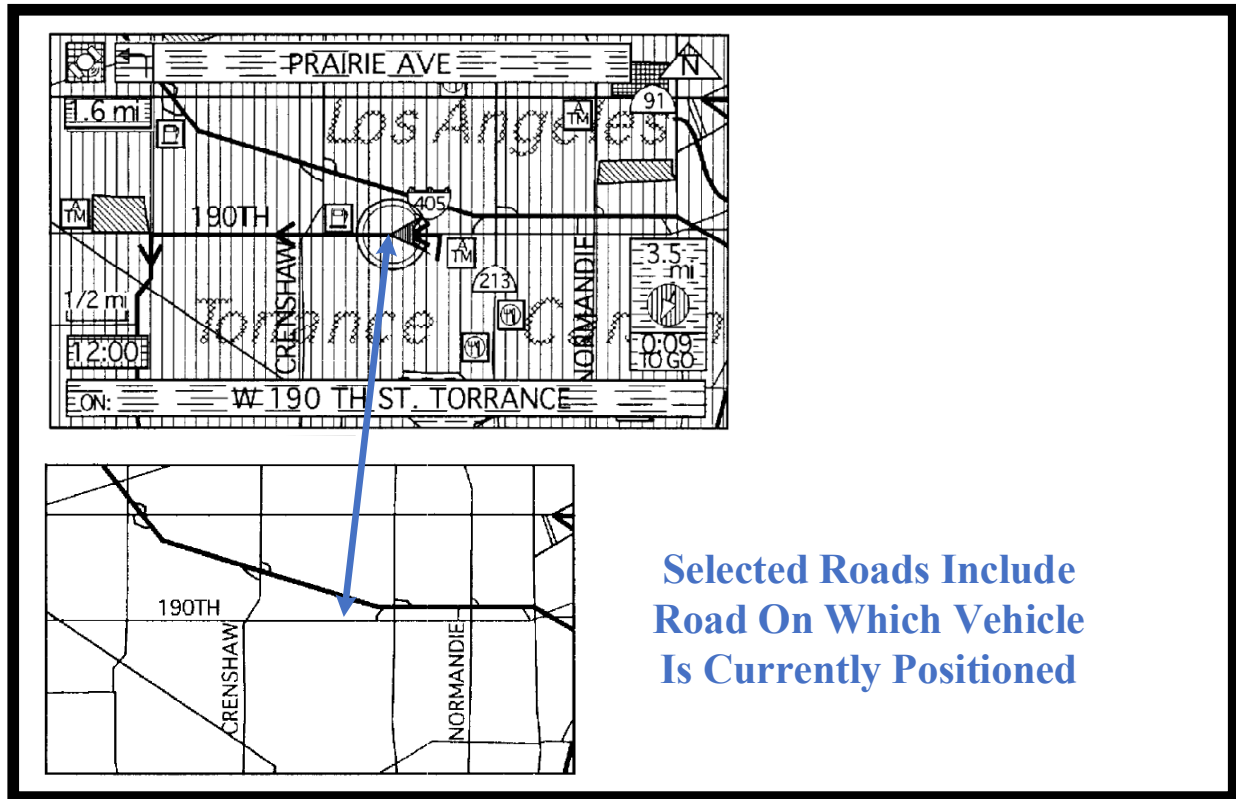
- (d) **Yokota Discloses “selecting the roads indicated by the attributes as being displayable according to a designed map scale, the selected roads including an own-vehicle position obtained by the position information acquiring section” (“Limitation [5c]”).**

Yokota discloses limitation [5c].

As discussed above with respect to limitation [1g], Yokota discloses selecting the roads indicated by the attributes as being displayable according to a driver-designated map scale. (EX1003, ¶175.) As shown below, Yokota also discloses obtaining an own-vehicle position using location system 28 (*i.e.*, the position information acquiring section) and that the selected roads include the road on which the vehicle is currently positioned. (*Id.*)



(*Id.*)



(*Id.*)

- (e) Yokota Discloses “drawing the selected roads and one or more of the display elements on the drawing memory” (“Limitation [5d]”).

Yokota discloses limitation [5d].

Yokota discloses drawing the selected roads and one or more display elements as layers, and a POSITA would have understood that these layers are drawn on Yokota’s drawing memory so that they can then be synthesized “into a single map display” to be sent to the display unit 20. (EX1003, ¶177; EX1005 at 11:1-17, FIG. 6C (showing selected city center display elements drawn as a layer), FIG. 6D

(showing selected roads drawn as a layer), FIG. 6E (showing facility display elements drawn as a layer); *see also id.* at 9:8-14, 10:51-67.)

- (f) Yokota Discloses And Suggests “further selecting each of the roads that is part of the calculated route produced as a result of the route calculation, but not indicated by the attributes as being displayable according to the designated map scale, on the drawing memory” (“Limitation [5e]”).**

As discussed above with respect to limitation [1h], Yokota discloses and suggests further selecting each of the roads that is part of the calculated route (which was produced as a result of the route calculation step) but not indicated by the attributes as being displayable according to the user-designated map scale. (EX1003, ¶179.) A POSITA would have understood that these roads are selected on Yokota’s drawing memory, as map data that is ultimately displayed is selected and drawn to memory to create the “single map display” that is sent to the display unit 20. (*Id.*, ¶180; EX1005 at 11:1-17.)

- (g) Yokota Discloses “displaying the road network drawn on the drawing memory on the display section” (“Limitation [5f]”).**

Yokota discloses limitation [5f].

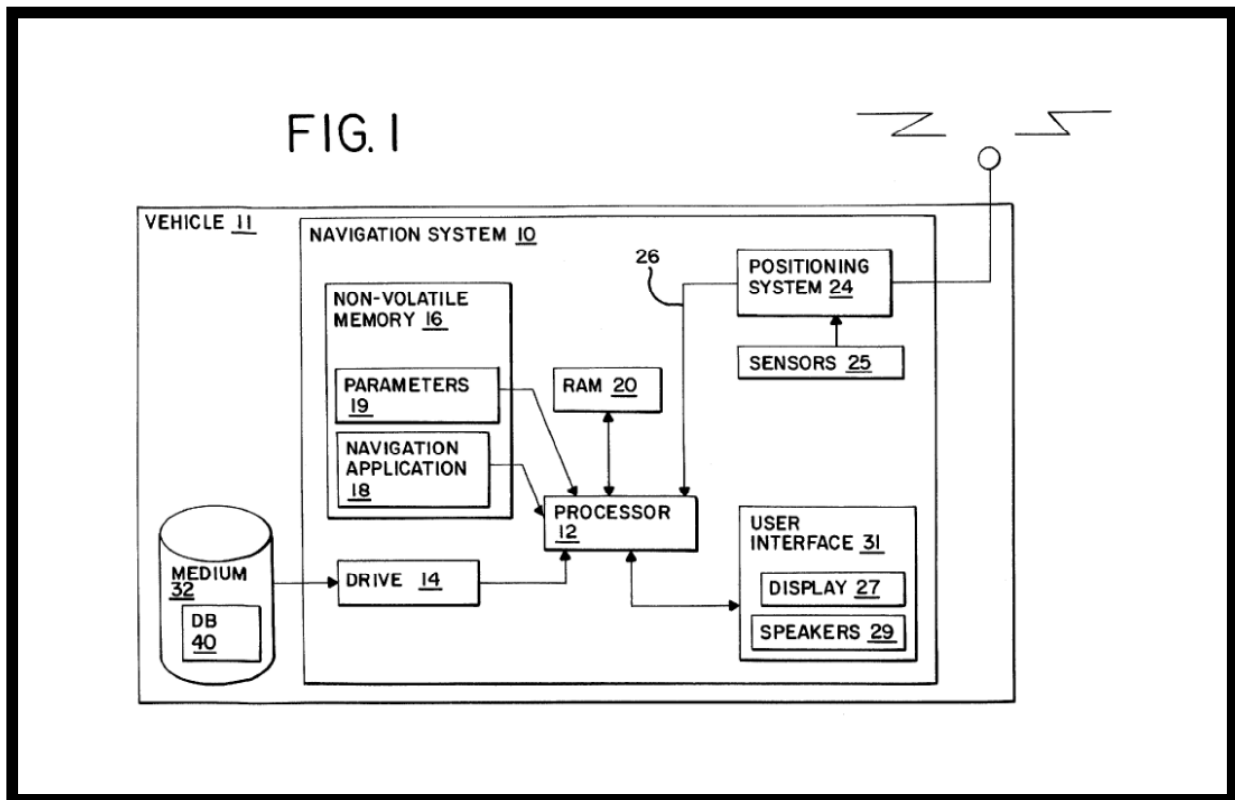
Yokota discloses displaying the road network drawn on the drawing memory (*e.g.*, the road network shown in Yokota’s FIGS. 7A-D) on display unit 20 (*i.e.*, the display section). (EX1005 at 10:51-59, 11:1-17; *see also id.* at Abstract, FIGS. 7A-D, 11:23-27, 13:9-12; EX1003, ¶183.)

B. GROUND 2: McDonough In Combination With Huber And Tanizaki Renders Obvious Challenged Claims 1-3 And 5.

1. Overview Of U.S. Patent No. 6,163,749 (“McDonough”).

McDonough was issued on December 19, 2000, and is thus prior art to the ‘465 patent under pre-AIA §102(b). (EX1007 at [45].)

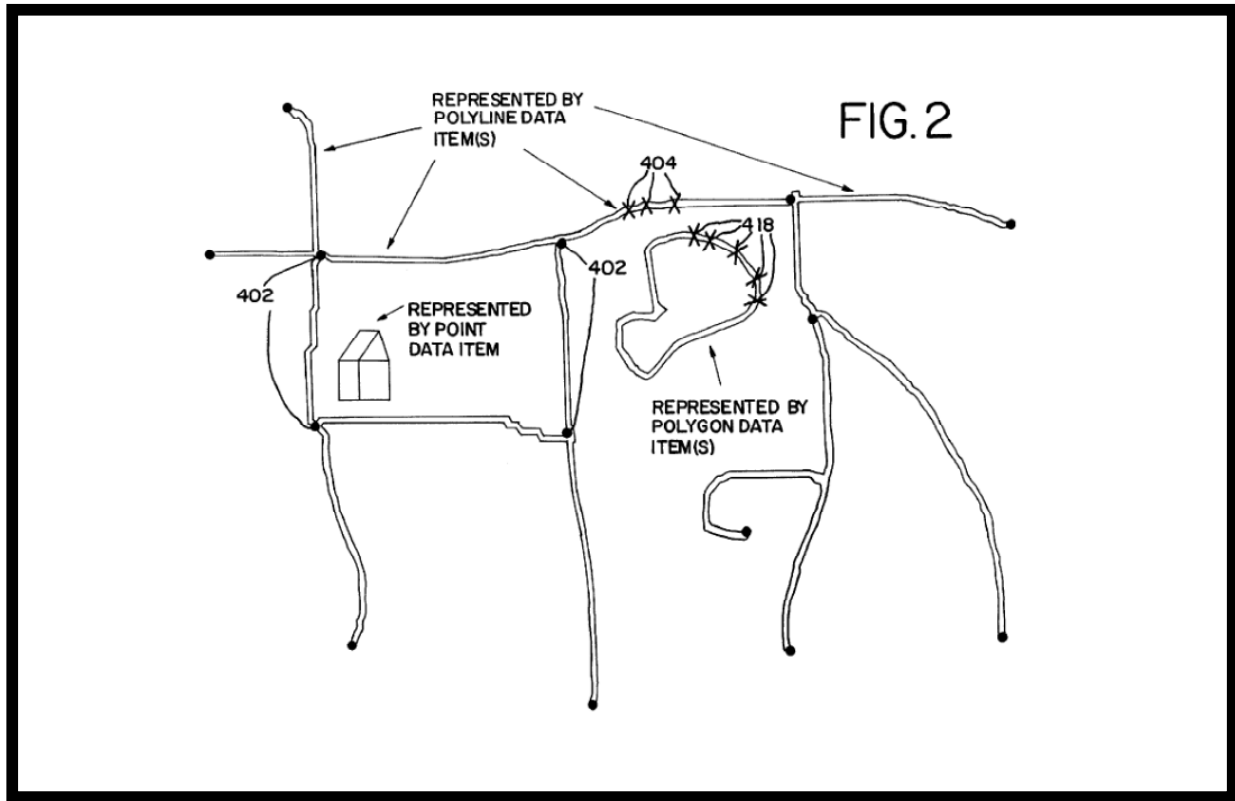
McDonough is directed to a navigation system 10 installed in a vehicle, such as a car or truck. (EX1007 at 3:20-28.) The navigation system 10 comprises, *inter alia*, a processor 12, a GPS-type positioning system 24, and a navigation software program 18 that runs on the processor 12. (*Id.* at 3:31-37, 3:45-48, 3:55-57.) McDonough’s navigation system is shown below:



(*Id.* at FIG. 1.)

McDonough's navigation system 10 also comprises a display 27 for displaying a map generated from map data stored in a map database 30. (*Id.* at 4:1-4, 6:59-7:5, 7:54-59; *see also id.* at 1:24-28, 2:3-9, 2:17-19, claim 1.) The navigation system 10 supports a “zooming” function that allows the user to zoom in and out on the displayed map. (*Id.* at 5:54-60, 6:31-33, 8:5-9.)

A map display tool 40 in the navigation software program 18 selects features from the map database 30 (*e.g.*, roads, point of interest icons, *etc.*) to be included in the displayed map. (*Id.* at 5:53-62, 6:9-33, 6:59-66, 7:1-9, 7:46-59, 8:17-27, 10:7-18, 13:33-38, 15:25-32.) Roads are selected based on whether stored “ranks” for the roads indicate that the roads are displayable according to the set map scale. (*Id.* at 5:63-6:33, 8:17-27, 8:40-43, 8:66-9:3, 10:7-18, 13:53-65.) Points of interest (*e.g.*, cities, restaurants, *etc.*) are selected based on their “priorities.” (*Id.* at 9:5-9, 16:57-17:11, 18:14-24.) The selected roads and points of interest are drawn to a graphics buffer, and the map, once rendered in the graphics buffer, is sent to display 27, as shown below. (*Id.* at 6:59-66, 7:6-9, 7:51-59, 12:33-41, 14:30-36, 14:53-56, 15:25-38, 19:31-32.)



(*Id.* at FIG. 2.)

McDonough's navigation software program 18 includes a navigation application 47 that provides "navigation features and functions" such as "route calculation, map display, vehicle positioning (e.g., map matching), route guidance (wherein detailed directions are provided for reaching a desired destination), destination resolution capabilities, and other functions." (*Id.* at 6:44-55, 7:9-24; *see also id.* at 1:9-28.) Using the navigation application 47, the navigation system 10 can display maps "that outline routes to destinations, the types of maneuvers to be taken at various locations along the routes, locations of certain types of features, and so on." (*Id.*)

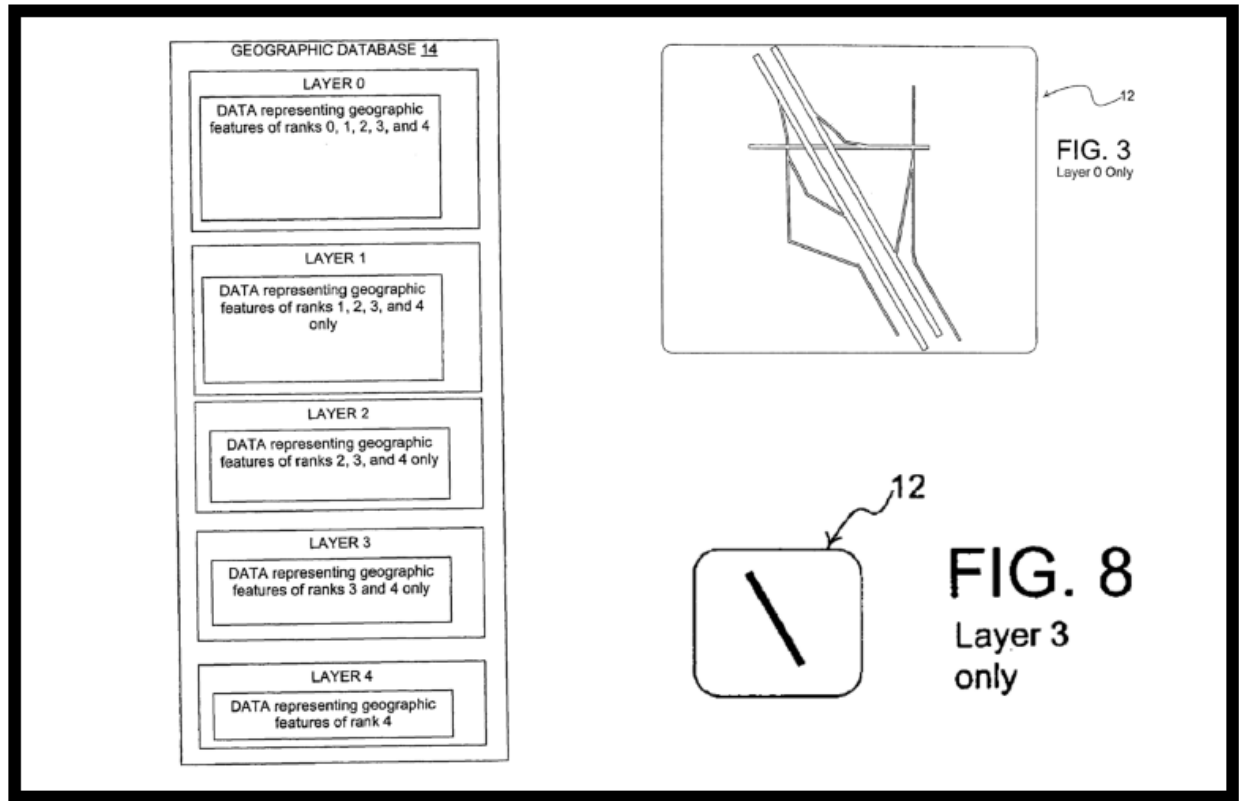
McDonough is analogous art to the ‘465 patent because McDonough is in the same field of endeavor as the ‘465 patent: navigation systems. (EX1003, ¶91; EX1001 at 1:7-8; EX1007 at 3:20-28.)

2. Overview Of U.S. Patent No. 7,023,456 (“Huber”).

Huber was issued on April 4, 2006, and is thus prior art to the ‘465 patent under pre-AIA §102(b). (EX1008 at [45].)

Huber is directed to a computing platform 10 in an “in-vehicle navigation system” that displays maps on a display, and “a method for representing geographic features when [the] map display is zoomed in or out.” (EX1008 at 1:11-15, 2:20-22, 3:14-15, 3:37-45.)

Huber incorporates McDonough by reference. (*Id.* at 3:40-45.) Huber also relies on McDonough’s disclosure to teach “display[ing] maps using data from a geographic database.” (*Id.*) Huber’s teachings relating to zooming (*e.g.*, organizing map data into layers and controlling the level of detail displayed at each map scale by assigning ranks to different road types) are virtually identical to, and complement, McDonough’s teachings regarding zooming. (*Compare id.* at 3:46-62, 3:63-4:5, 5:36-50 *with* EX1007 at 5:53-60, 5:63-6:8, 6:9-33.) Huber provides additional details and context regarding McDonough’s zoom functionality. (*Id.*) Examples of Huber’s database layer organization and the display of certain layers are shown below:



(EX1008 at FIGS. 2-3 and 8.)

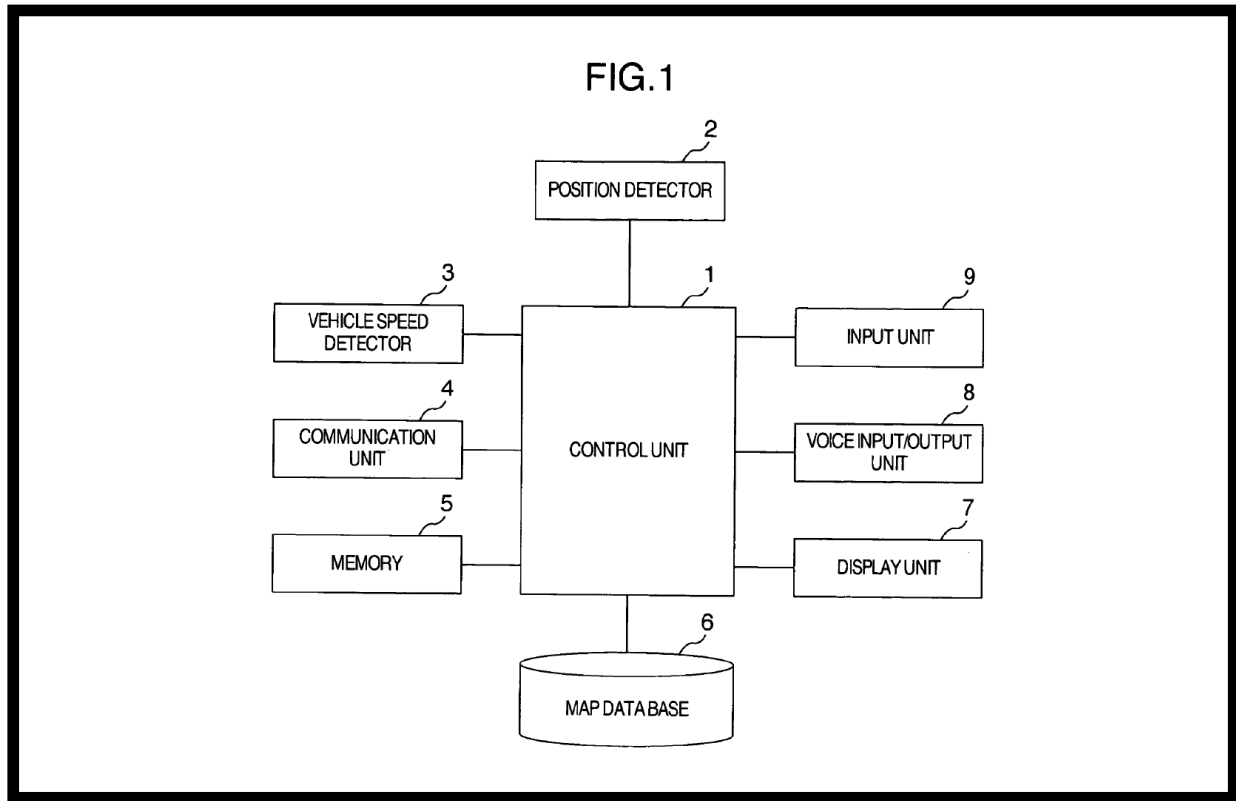
Huber is analogous art to the '465 patent because Huber is in the same field of endeavor as the '465 patent: navigation systems. (EX1003, ¶94; EX1001 at 1:7-8; EX1008 at 3:15-19.)

3. Overview Of U.S. Patent App. Pub. No. 2006/0220923 ("Tanizaki").

Tanizaki was filed in the US on August 18, 2004, and published on October 5, 2006, and is thus prior art to the '465 patent under pre-AIA §§102(a) and (e). (EX1009 at [22], [43].)

Tanizaki is directed to "a car navigation apparatus" comprising, *inter alia*, a position detector 2, a map database 6, and a display unit 7 with a display screen 10.

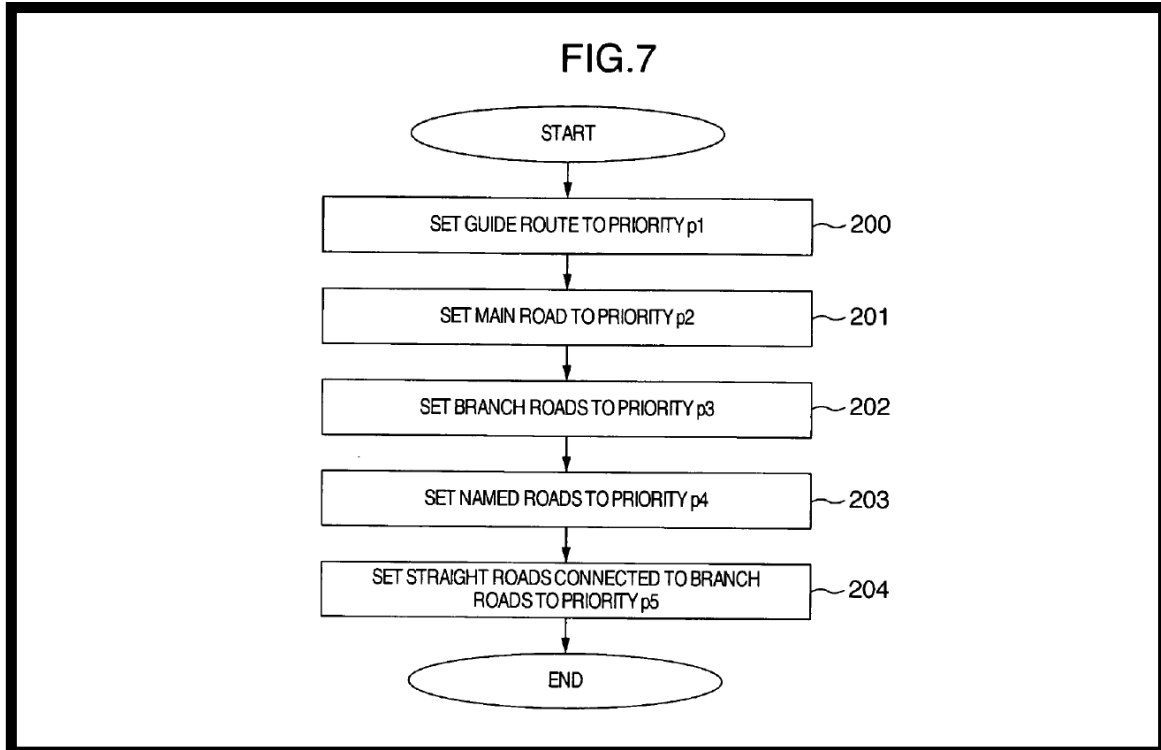
(EX1009 at [0014], [0027], FIG. 1.) Tanizaki's navigation apparatus is shown below:



(*Id.* at FIG. 1.)

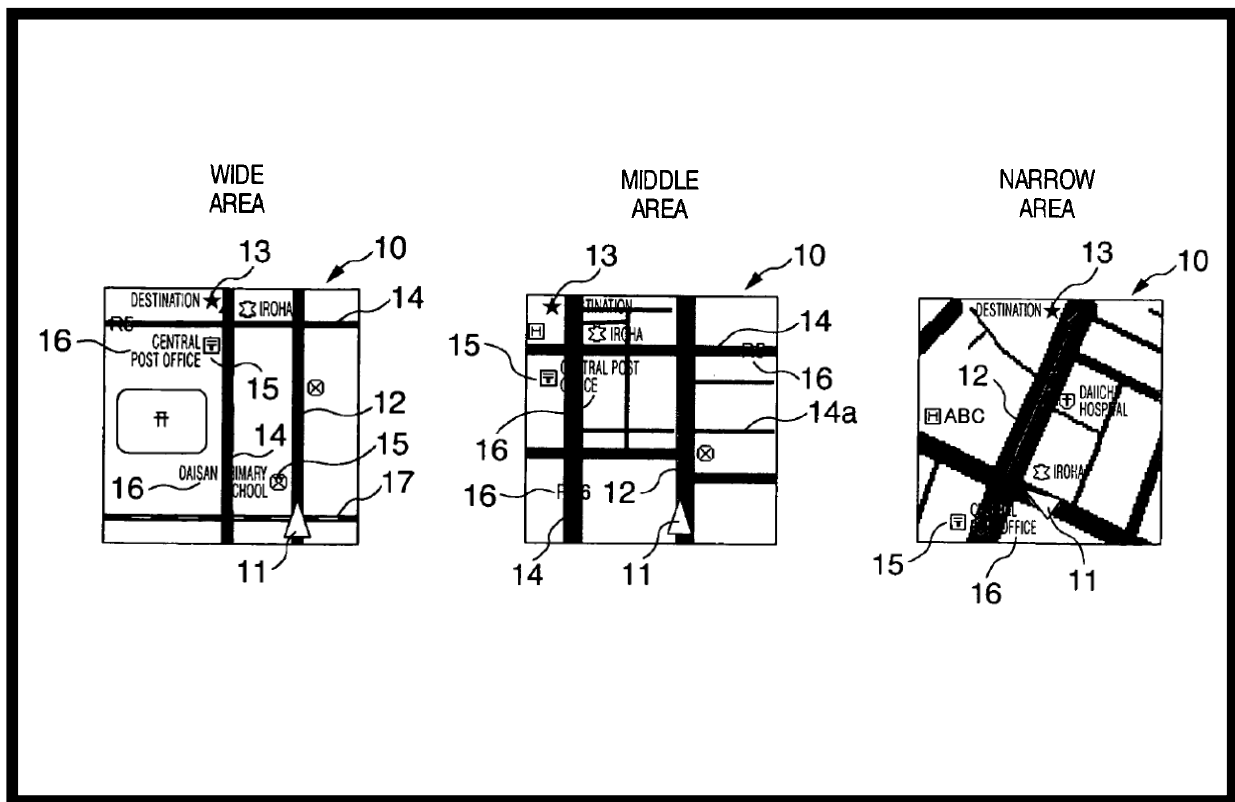
Tanizaki's map database 6 includes road data and display element data (*e.g.*, names and icons for facilities) that is read from the database to create a road map displayed on display unit 7. (*Id.* at [0016], [0019].) The displayed road map includes a vehicle guide route 12, a destination 13, and roads other than the guide route 14. (*Id.* at [0022], [0027].) The road map can be displayed at a plurality of different map scales, wherein the amount of detail displayed is decreased as the map is zoomed out. (*Id.* at [0023]-[0026], [0036], [0053].)

To display the guide route 12, Tanizaki's navigation apparatus first receives a current vehicle position 11 from position detector 2 and a driver-specified destination 13 from input unit 9, and then calculates a route from the vehicle position 11 to the destination 13 using "predetermined conditions." (*Id.* at [0042], [0044]; *see also id.* at FIG. 4 (reference numerals 100-102), FIG. 9 (same).) Priorities are then set for the roads in map database 6. (*Id.* at [0054]-[0056], [0058]-[0059], FIGS. 7-8, claim 3.) As shown below, the roads in the guide route 12 are set to the highest priority, while roads that are not in the guide route are set to lower priorities based on road type (*e.g.*, main roads are set to the second-highest priority, branch roads are set to a next highest priority, etc.). (*Id.*)



(*Id.* at FIG. 7.)

Roads in map database 6 are then selected for display in “descending order of priority.” (*Id.* at [0054], [0072], claim 3.) Because all roads in guide route 12 are set to the highest priority irrespective of road type, the map “is displayed on the display screen 10 in such a manner as to include the guide route from the present vehicle position to the destination” regardless of the map scale. (*Id.* at [0028]; *see also id.* at [0029]-[0031], [0077], FIGS. 2A-C (displaying roads included in guide route 12 regardless of map scale), FIGS. 3A-C (same), claims 1 and 9.)



(*Id.* at FIGS. 2A-C.)

Tanizaki is analogous art to the ‘465 patent as Tanizaki is in the same field of endeavor as the ‘465 patent: navigation systems. (EX1003, ¶99; EX1001 at 1:7-8,

1:43-50, 2:23-29; EX1009 at [0014], [0028]-[0031], [0077], FIGS. 2A-C and 3A-C, claims 1 and 9.) Tanizaki is also analogous art to the ‘465 patent because it is reasonably pertinent to a problem addressed by the ‘465 patent: displaying a guide route with no discontinuities. (*Id.*)

4. Motivation To Combine McDonough With Huber.

McDonough is directed to a navigation system that displays maps on a display. (EX1007 at 1:8-28, 3:20-28, 6:59-66.) While McDonough discloses that its navigation system has a “zoom” function (*id.* at 5:54-60, 6:31-33, 8:5-9), McDonough’s disclosure is focused on the system’s “scrolling” function. (*Id.* at Abstract (“A system and method for implementing a smooth scrolling function in a map display...”); *see also id.* at 1:6-7.)

Huber *incorporates McDonough by reference* and relies on McDonough’s disclosure to teach “display[ing] maps using data from a geographic database.” (EX1003, ¶184; EX1008 at 3:40-45.) To obtain greater context and detail regarding McDonough’s zoom functionality, a POSITA would have been motivated to turn to Huber, which incorporates by reference and relies on McDonough. (EX1003, ¶184; EX1008 at 3:40-45.)

Like McDonough, Huber is directed to an “in-vehicle navigation system” that displays maps on a display. (EX1008 at 3:14-15, 3:37-45.) Huber’s navigation system, like McDonough’s navigation system, supports zoom functionality. (*Id.* at

1:11-15, 2:20-22, 4:24-27.) Indeed, Huber is directed to “a method for representing geographic features when a map display is zoomed in or out.” (*Id.* at 2:20-22; *see also id.* at 1:11-15.) Huber’s zooming-related teachings (*e.g.*, organizing map data into layers and controlling the level of detail displayed at each map scale by assigning ranks to different road types) are also virtually identical to, and complement, McDonough’s zooming teachings. (*Compare id.* at 3:46-62, 3:63-4:5, 5:36-50 *with* EX1007 at 5:53-60, 5:63-6:8, 6:9-33; EX1003, ¶186.) Both McDonough and Huber were owned by the same entity: Navteq North America, LLC. (EX1007 at [73]; EX1008 at [73]; EX1010 at 2-3.)⁷

McDonough and Huber are so inter-related that a POSITA would have understood that the references should be read together. (EX1003, ¶187.) A POSITA would have understood that Huber supplements McDonough’s teachings and provides additional design details and examples of zooming. (*Id.*) For example, Huber clarifies that the driver sets different map scales using an input device and provides a specific example of the driver zooming out from a layer “0” map scale to a layer “3” map scale. (*Id.*) The additional details and examples disclosed in Huber

⁷ Navigation Technologies Corp. changed its name to Navteq North America, LLC in 2004. (EX1010 at 1, 4.)

provide relevant context that would have been helpful to a POSITA in understanding McDonough's disclosures. (*Id.*)

A POSITA would have had a reasonable expectation of success in combining McDonough with Huber. (*Id.*, ¶188.) The references were owned by the same company, describe virtually identical navigation systems, provide complementary teachings regarding zooming, and would have been read together as a single work. (*Id.*) A POSITA would have found it trivial to use Huber's additional details regarding the zoom functionality to interpret McDonough. (*Id.*)

Accordingly, a POSITA would have found it obvious to turn to Huber to provide more detail and context regarding McDonough's zoom functionality. (*Id.*)

5. Motivation To Combine McDonough And Huber With Tanizaki.

McDonough's navigation system 10 comprises a display 27 for displaying maps generated from map data in a map database 30. (EX1007 at 4:1-4, 6:59-7:5, 7:54-59; *see also id.* at 1:24-28, 2:3-9, 2:17-19, claim 1.) The features to be included in the map (*e.g.*, roads, point of interest icons, etc.) are selected from the map database using a map display tool 40. (*Id.* at 5:53-62, 6:9-33, 6:59-66, 7:1-9, 7:46-59, 8:17-27, 10:7-18, 13:33-38, 15:25-32.) Roads are selected based on whether stored "ranks" for the roads indicate that the roads are displayable according to a set map scale. (*Id.* at 5:63-6:33, 8:17-27, 8:40-43, 8:66-9:3, 10:7-18, 13:53-65.) Points of interest (*e.g.*, city centers and facilities) are selected based on their "priorities."

(*Id.* at 9:5-9, 16:57-17:11, 18:14-24.) The selected roads and points of interest are drawn to a graphics buffer, and the map, once rendered in the graphics buffer, is sent to display 27. (*Id.* at 6:59-66, 7:6-9, 7:51-59, 12:33-41, 14:30-36, 14:53-56, 15:25-38, 19:31-32.)

McDonough's navigation system 10 also comprises a navigation software program 18 that provides "navigation features and functions" such as "route calculation, map display, vehicle positioning (e.g., map matching), route guidance (wherein detailed directions are provided for reaching a desired destination), destination resolution capabilities, and other functions." (*Id.* at 6:44-55, 7:9-20; *see also id.* at 1:9-28.) Using the navigation software program 18, the navigation system 10 is able to display maps "that outline routes to destinations, the types of maneuvers to be taken at various locations along the routes, locations of certain types of features, and so on." (*Id.*) McDonough does not specify how its navigation system 10 displays a calculated route to a destination. (*Id.*; EX1003, ¶190)

In the same field of endeavor, Tanizaki discloses "a car navigation apparatus" comprising, *inter alia*, a position detector 2, a map database 6, and a display unit 7 with a display screen 10. (EX1009 at [0014], [0027], FIG. 1.) The map database 6 includes road data and display element data that is read from the database to create a road map displayed on display unit 7. (*Id.* at [0016], [0019].) The displayed road map includes a vehicle guide route 12, a destination 13, and roads other than the

guide route 14. (*Id.* at [0022], [0027].) The road map can be displayed at a plurality of different map scales, wherein the amount of detail displayed is decreased as the map is zoomed out. (*Id.* at [0023]-[0026], [0036], [0053].)

To display the guide route 12, Tanizaki's navigation apparatus first receives a current vehicle position 11 from position detector 2 and a driver-specified destination 13 from input unit 9, and then calculates a route from the vehicle position 11 to the destination 13 using "predetermined conditions." (*Id.* at [0042], [0044]; *see also id.* at FIG. 4 (reference numerals 100-102), FIG. 9 (same).) Priorities are then set for the roads in map database 6. (*Id.* at [0054]-[0056], [0058]-[0059], FIGS. 7-8, claim 3.) The roads in the guide route 12 are set to the highest priority, while roads that are not in the guide route are set to lower priorities based on road type (*e.g.*, main roads are set to a second-highest priority, branch roads are set to a next highest priority, etc.). (*Id.*)

Roads in map database 6 are then selected for display in "descending order of priority." (*Id.* at [0054], [0072], claim 3.) Because all roads in guide route 12 are set to the highest priority irrespective of road type, the map "is displayed on the display screen 10 in such a manner as to include the guide route from the present vehicle position to the destination" regardless of the map scale. (*Id.* at [0028]; *see also id.* at [0029]-[0031], [0077], FIGS. 2A-C (displaying roads included in guide

route 12 regardless of map scale), FIGS. 3A-C (same), claims 1 and 9; EX1003, ¶193.)

Turning back to McDonough, a POSITA would have recognized that McDonough's map display technique would not select (and thus would not display) roads in the calculated guide route that have a "rank" that is less than the set map scale, which would lead to discontinuities in the displayed guide route. (EX1003, ¶194; EX1007 at 5:63-6:33, 10:7-18.) For example, a road in the calculated guide route of rank "2" would not be selected and displayed when the map scale is set to layer "3," creating a route discontinuity where the rank "2" road should be. (*Id.*) Consequently, a POSITA would have been motivated to modify McDonough's navigation system 10 to further select (and draw on McDonough's graphics buffer) each of the roads that is part of the calculated route but not indicated by the ranks as being displayable according to the selected map scale so that all roads in the designated map area that are part of the calculated route are displayed regardless of the map scale, as taught in Tanizaki. (EX1003, ¶194.)

In vehicular navigation systems, a guide route is a continuous series of roads that the driver is supposed to follow to reach a destination. (EX1003, ¶195.) Thus, navigation system users expect a guide route to be displayed as a continuous line leading from a starting location to a destination. (*Id.*) A POSITA would have known that McDonough's map display technique would lead to *discontinuities* in the

displayed guide route at certain map scales, which would undesirably confuse the driver who is expecting to see a continuous route. (*Id.*) On the other hand, a POSITA would have recognized that Tanizaki's teachings desirably prevent discontinuities in the displayed guide route regardless of the map scale, which would advantageously lessen driver confusion. (*Id.*) A POSITA also would have recognized that Tanizaki's teachings beneficially increase driver safety in the use of the navigation system by avoiding distraction where the driver, due to route discontinuities, is uncertain regarding his or her current whereabouts, where he or she is relative to the guide route, and/or where he or she is relative to the destination. (*Id.*)

Prior to the alleged invention of the '465 patent, it was common for navigation system users to "zoom out" before starting a journey to see the entire guide route. (*Id.*, ¶196.) This allowed the driver to visualize the entire route and plan potential stops along the way. (*Id.*) If the driver did not like the proposed route, the driver could ask the navigation system to calculate a new route to the destination. (*Id.*) A POSITA would have recognized that, by preventing discontinuities in the displayed guide route even when the driver zooms out to see the entire guide route, the proposed modification would have made it easier for drivers to plan their trip and decide whether to request a new route. (*Id.*)

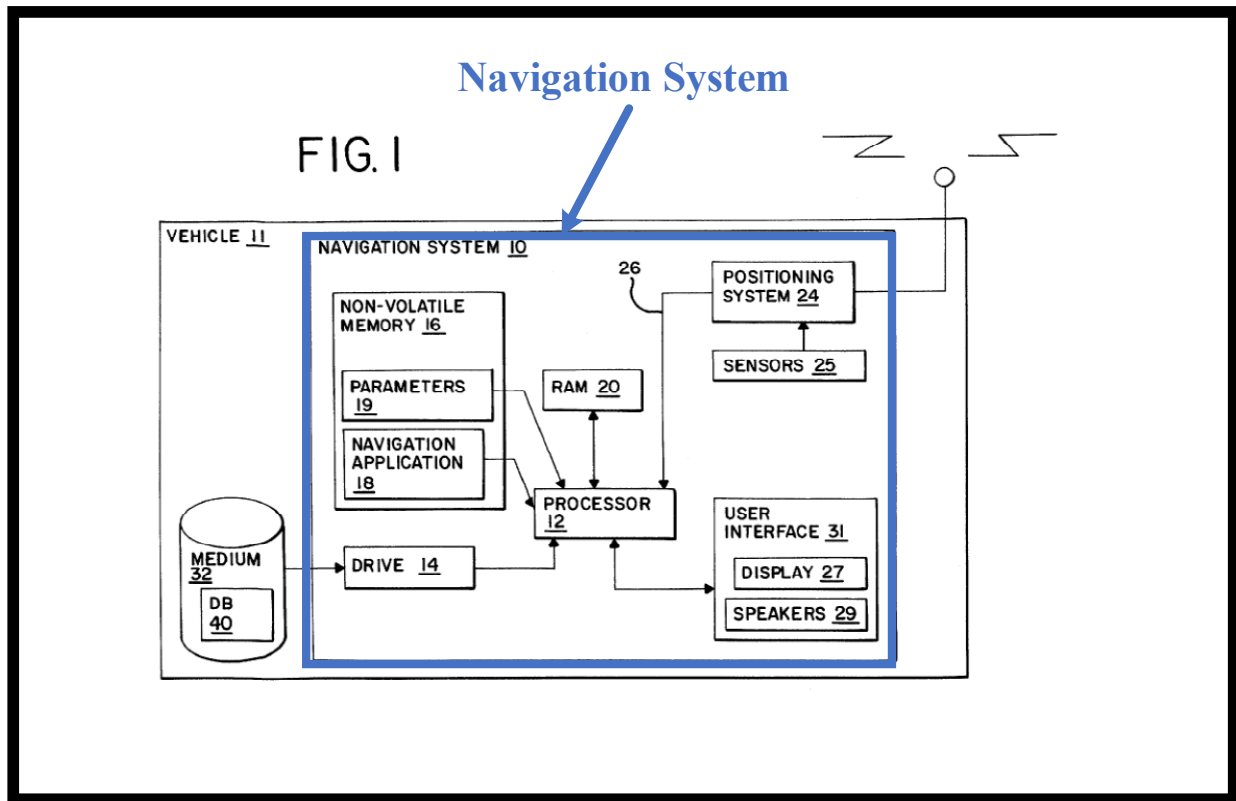
A POSITA would have had a reasonable expectation of success in implementing the proposed modification. (*Id.*, ¶197.) A POSITA would have recognized that McDonough already discloses the hardware and software needed for implementing the proposed modification, including a processor 12, a positioning system 24, a display 27, and a navigation program 18 with a navigation application 47 and a map display tool 40. (*Id.*; EX1007 at 3:31-37, 3:45-48, 4:1-4, 7:9-20, FIG. 1, FIG. 6.) McDonough also teaches that map display tool 40 (which is used to select roads from the database 30) interfaces with, and receives input from, navigation application 47 (which is used to calculate guide routes). (EX1007 at 7:9-24, 7:51-52; *see also id.* at FIG. 6, 6:44-55.) A POSITA would have known that implementing the proposed modification would have required routine, straightforward adjustments to the programming logic in McDonough's map display tool 40 (*i.e.*, logic to additionally select roads from map database 30 that are part of the guide route received from navigation application 47). (EX1003, ¶197.)

Accordingly, a POSITA would have found it obvious to modify McDonough in view of Tanizaki to further select (and draw on McDonough's graphics buffer) each of the roads that is part of the calculated route but not indicated by the ranks as being displayable according to the selected map scale.

6. McDonough In Combination With Huber And Tanizaki Renders Obvious Challenged Claim 1.

(a) McDonough Discloses Limitation [1-PRE].

To the extent the preamble of Challenged Claim 1 is limiting, McDonough discloses limitation [1-PRE]. As shown below, McDonough discloses a “navigation system 10.” (EX1007 at 2:33-34, 3:20-28, 3:31-33; *see also id.* at Abstract, 1:8-28, 2:17-19; EX1003, ¶200.)

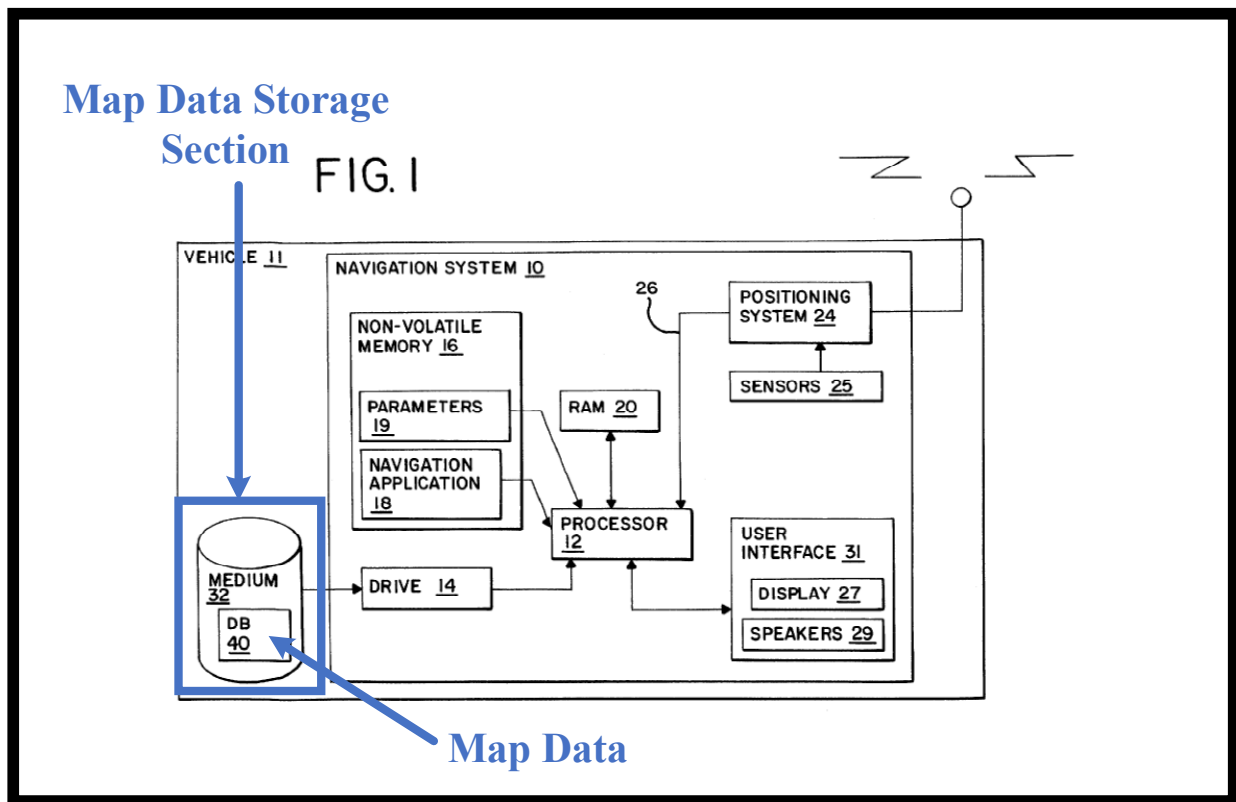


(EX1007 at FIG. 1 (annotated).)

(b) McDonough Discloses Limitation [1a].

McDonough discloses limitation [1a].

McDonough discloses a map database 30 with “map data” that is stored on a storage medium 32 (*i.e.*, a map data storage section). (EX1007 at 2:9-13, 4:5-6, 6:63-64, 9:13-16, claim 1; EX1003, ¶202.) The storage medium 32 is installed in a drive 14 of the navigation system 10 “so that the map database can be read and used by the navigation system.” (EX1007 at 4:6-8, 4:14-21; EX1003, ¶203.) The storage medium 32 may be, for example, a CD-ROM disc, a DVD, a PCMCIA card, or a hard disk. (*Id.*) McDonough’s map data storage section is shown below:

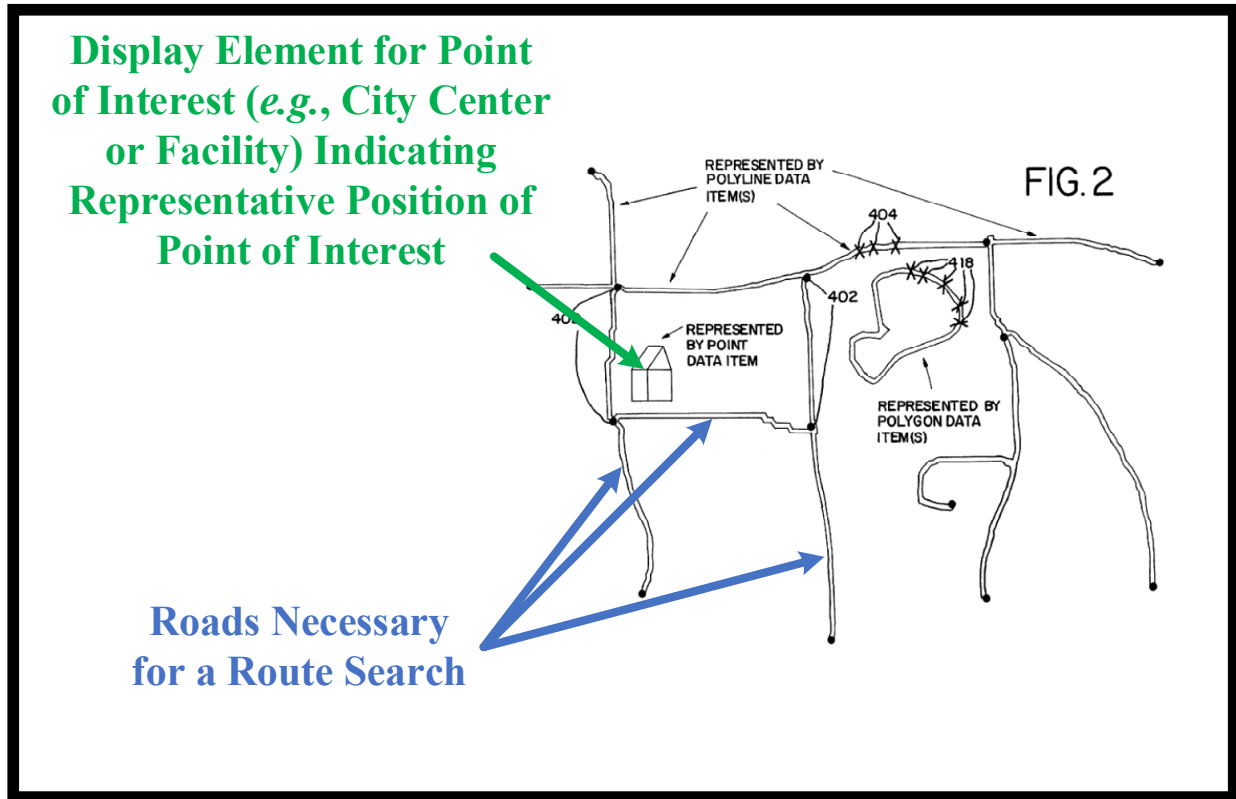


(*Id.* at FIG. 1 (annotated); *see also id.* at FIG. 6.)

McDonough further discloses that map data “includes data which represent the road network in a region, including the roads and intersections in the region”

(*i.e.*, the roads necessary for a route search). (EX1007 at 1:33-39; *see also id.* at FIG. 2, 4:24-26, 8:31-40; EX1003, ¶204.) “Features such as roads ... are represented by polyline information in the map database.” (EX1007 at 4:28-30; *see also id.* at FIG. 3, 4:40-47; EX1003, ¶204.)

McDonough’s map data also includes point data items 428 that are displayed as icons (*i.e.*, display elements) on a display. (EX1007 at 5:45-52; *see also id.* at 4:24-26, 4:34-38, 12:47-50; EX1003, ¶205.) McDonough’s point data items 428 represent points of interest including cities (*i.e.*, city centers), as well as museums, restaurants, and the like (*i.e.*, facilities). (EX1007 at 1:39-41, 4:30-33, 8:31-40, 9:15-23; *see also id.* at 15:25-38; EX1003, ¶206.) McDonough’s point data items 428 “contain point position data 430 describing the latitude and longitude of the point of interest” so that an icon for the point of interest (*e.g.*, a city center) can be correctly placed to indicate the representative position of the point of interest. (EX1007 at 5:45-52, 9:20-23, FIG. 5 (at reference numeral 430), FIG. 10 (at reference numeral 84); EX1003, ¶207.) Examples of roads and display elements stored in McDonough’s map database 30 are shown below:



(EX1007 at FIG. 2 (annotated).)

McDonough also teaches that its map data storage section stores, for each road segment data record in the map database 30, a “rank” of the represented road that corresponds to the road’s class (*e.g.*, freeway, alleyway, etc.). (EX1007 at 5:63-6:8; *see also id.* at 5:27-30; EX1003, ¶208.) In one example, the ranks range from “0” to “4.” (*Id.*) High volume roads such as expressways and freeways may have a rank of “4,” while lowest volume roads such as alleyways may have a rank of “0.” (*Id.*)

McDonough further teaches a plurality of data layers that range from “0” to “4.” (EX1007 at 6:10-14; EX1003, ¶209.) Each data layer corresponds with a different map scale. (EX1007 at 5:53-62, 6:10-14, 6:31-33; *see also id.* at 10:7-18

(providing an example where layer 4 corresponds with a 40-mile map scale and layer 3 corresponds with a 30-mile map scale); EX1003, ¶209.)⁸ Layer “0” is the most “zoomed in” map scale and provides the greatest level of detail, while layer “4” is the most “zoomed out” map scale and provides the lowest level of detail. (*Id.*)

According to McDonough, the rank of a road segment indicates “the highest data layer in which [the] road segment is included.” (EX1007 at 6:9-10; EX1003, ¶211.) When the map scale is set to layer 0 (*i.e.*, the most “zoomed in” scale), “all the portions of all the roads in the geographic region” will be displayed. (EX1007 at 6:15-29; EX1003, ¶211.) When the map scale is set to layer 4 (*i.e.*, the most “zoomed out” scale), only roads having a rank of 4 will be displayed. (*Id.*; *see also* EX1008 at FIG. 2.) A POSITA would have understood that McDonough’s ranks are “attributes” indicative of whether or not each of the roads in the map database 30 should be displayed for each of a plurality of map scales (*i.e.*, a rank of “0” indicates that the road should be displayed only on the layer 0 map scale, a rank of “1” indicates that the road should be displayed only on the layer 0 and layer 1 map scales, etc.). (EX1003, ¶211.)

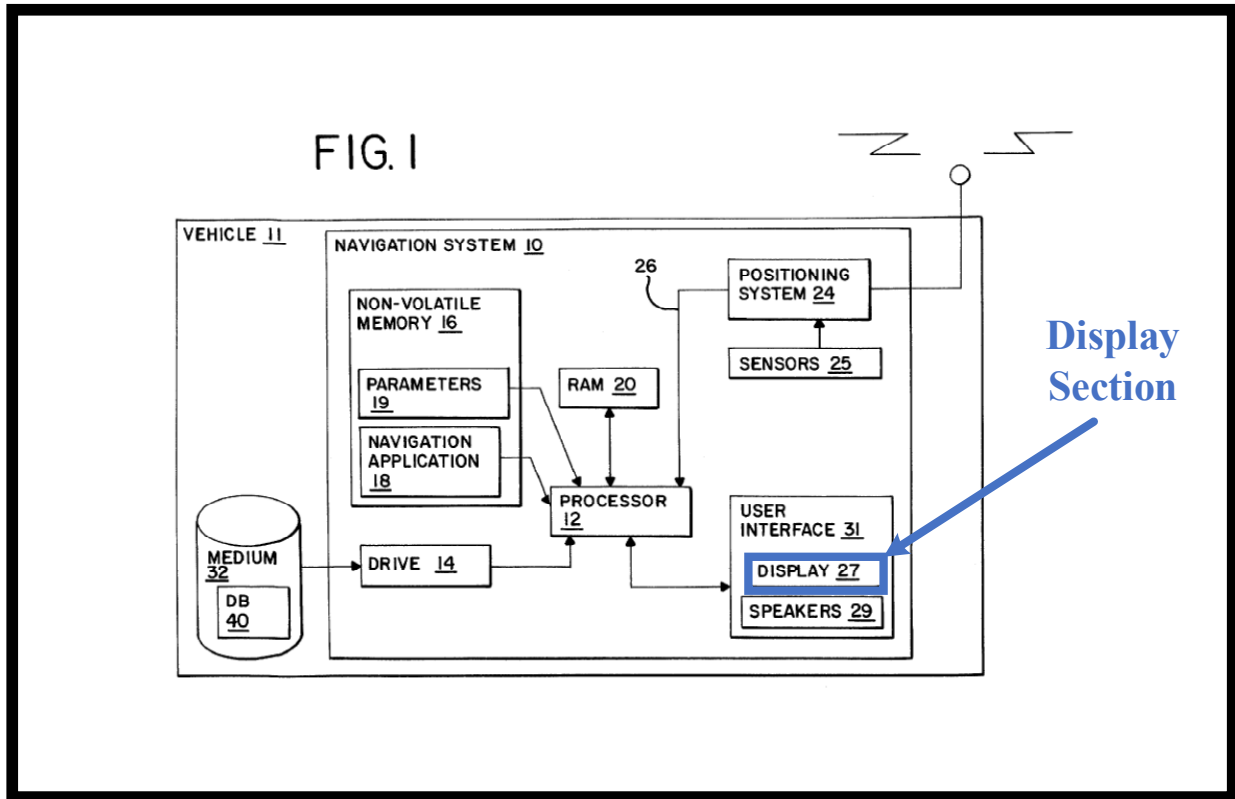
⁸ Huber discloses and confirms that each data layer corresponds with a different map scale. (EX1008 at 1:57-60, 4:55-57, 5:36-50, 6:32-35; *see also id.* at Abstract, FIG. 3, FIG. 8, 2:20-26, 3:46-62, 4:6-12, 7:15-17, claim 1; EX1003, ¶210.)

McDonough also teaches that its map data storage section stores the “type” (*i.e.*, class) of each item of map data in the map database 30. (EX1007 at FIGS. 3-5 (reference numerals 412, 426, 438), 5:21-27, 5:45-52; EX1003, ¶212.) For example, the map data storage section stores whether each road is an expressway, tollway, alley, side street, etc. (EX1007 at 5:21-27, 5:63-6:8; EX1003, ¶212.)

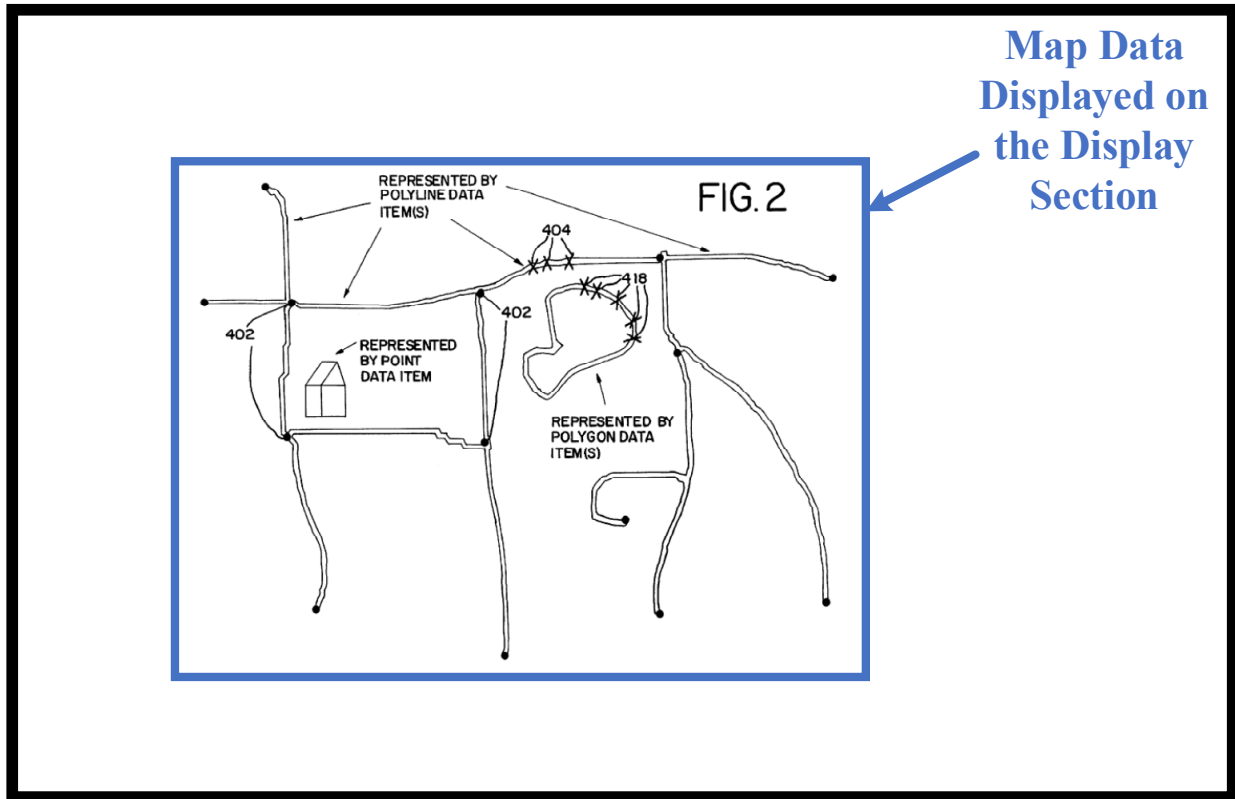
(c) McDonough Discloses Limitation [1b].

McDonough discloses limitation [1b].

McDonough discloses that navigation system 10 comprises a display 27 (*i.e.*, a display section) for displaying maps generated from the map data in the map database 30. (EX1007 at 4:1-4, 6:59-7:5, 7:54-59; *see also id.* at 1:24-28, 2:3-9, 2:17-19, claim 1; EX1003, ¶214.) McDonough’s display section is shown below:



(EX1007 at FIG. 1 (annotated).)



(*Id.* at FIG. 2 (annotated).)

(d) McDonough Discloses Limitation [1c].

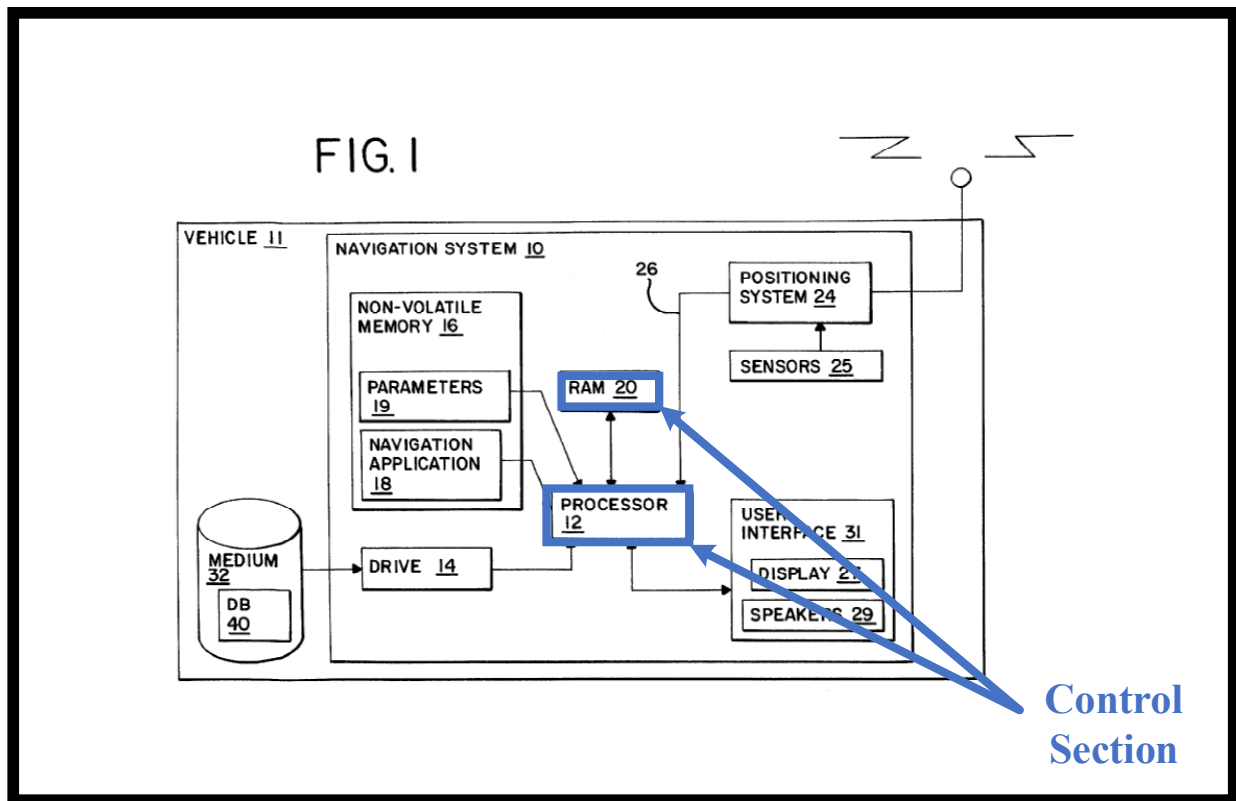
McDonough discloses limitation [1c].

McDonough discloses that navigation system 10 comprises “appropriate equipment that allows the end-user to input information into the navigation system,” such as a keypad, keyboard, or microphone (*i.e.*, an input section). (EX1007 at 3:58-4:1; EX1003, ¶216.) The input section is used for inputting driver instructions, such as “a request to display a location on a map in a desired manner.” (EX1007 at 1:10-17, 3:58-4:1; EX1003, ¶217.)

(e) **McDonough Discloses Limitation [1d].**

McDonough discloses limitation [1d].

McDonough discloses that navigation system 10 comprises a processor 12 and associated RAM 20 (collectively, a control section) for operating the navigation system. (EX1007 at 3:33-44, 6:40-44; EX1003, ¶219.) As demonstrated below, McDonough's control section is configured to carry out various procedures. McDonough's control section is shown below:



(*Id.* at FIG. 1 (annotated).)

(f) McDonough In Combination With Tanizaki Teaches And Renders Obvious Limitation [1e].

McDonough in combination with Tanizaki teaches and renders obvious limitation [1e].

McDonough discloses a procedure of performing “route calculation” to “a desired destination” using a navigation software program 18 running on processor 12. (EX1007 at 3:55-57, 6:40-55, 7:14-24; *see also id.* at FIG. 6, 1:12-28; EX1003, ¶222.) While McDonough does not expressly state where the calculated route begins (McDonough refers to a “starting location”), McDonough’s teaching that the navigation system uses “input from ... equipment that can determine the end-user’s physical location (such as a GPS system) ... [to] examine various routes between two locations to determine an optimum route to travel” is consistent with, and suggests, beginning the calculated route at the present position of the vehicle (*i.e.*, an own-vehicle position). (EX1003, ¶223; EX1007 at 1:12-17.)

A POSITA would also have found it obvious to begin the calculated route at the present position of the vehicle (*i.e.*, an own-vehicle position), as taught in Tanizaki. (EX1003, ¶224; EX1009 at Abstract, [0007], [0028], [0036], [0042], [0044], claim 1.) Prior to the alleged invention of the ‘465 patent, it was common for vehicle-based navigation systems such as McDonough’s navigation system 10 and Tanizaki’s navigation apparatus to calculate a route from the vehicle’s current position to a driver-specified destination. (EX1003, ¶224.) A POSITA would have

been motivated to begin McDonough’s calculated route at the vehicle’s current position: (i) to increase driver convenience by eliminating the need for the driver to manually enter a route starting point; (ii) to simplify the route guidance process for the driver by placing the driver’s vehicle on the guidance route immediately once the destination is entered; and (iii) to prevent driver confusion when the driver’s current position differs from the route starting point (*e.g.*, where the driver does not know how to get from his or her current position to the route starting point). (*Id.*)

A POSITA would also have understood that the destination is input using McDonough’s input section. (EX1003, ¶225.) McDonough states that the navigation system calculates a route to the destination “[u]sing input from the end-user,” which itself suggests inputting a destination using McDonough’s input section as McDonough’s input section is responsible for “input[ting] information” (*e.g.*, a destination) into the navigation system 10. (*Id.*; EX1007 at 1:12-17, 3:58-41.) McDonough also teaches guiding the driver to a “desired destination” (EX1007 at 6:52-55), and a POSITA would have known that McDonough’s navigation system 10 would not know where the driver wants to go without the driver’s input. (EX1003, ¶225.)

It would also have been obvious to represent the driver-input destination with a display element, as taught in Tanizaki. (EX1003, ¶226.) Tanizaki teaches using a display element (*i.e.*, a star icon) to represent the driver’s destination, which was

common well before the alleged invention of the ‘465 patent. (EX1009 at FIGS. 2A-C, 3A-C, 6; EX1003, ¶226.) A POSITA would have known that displaying a guidance route that ends abruptly could confuse the driver and could cause safety issues. (EX1003, ¶226.)

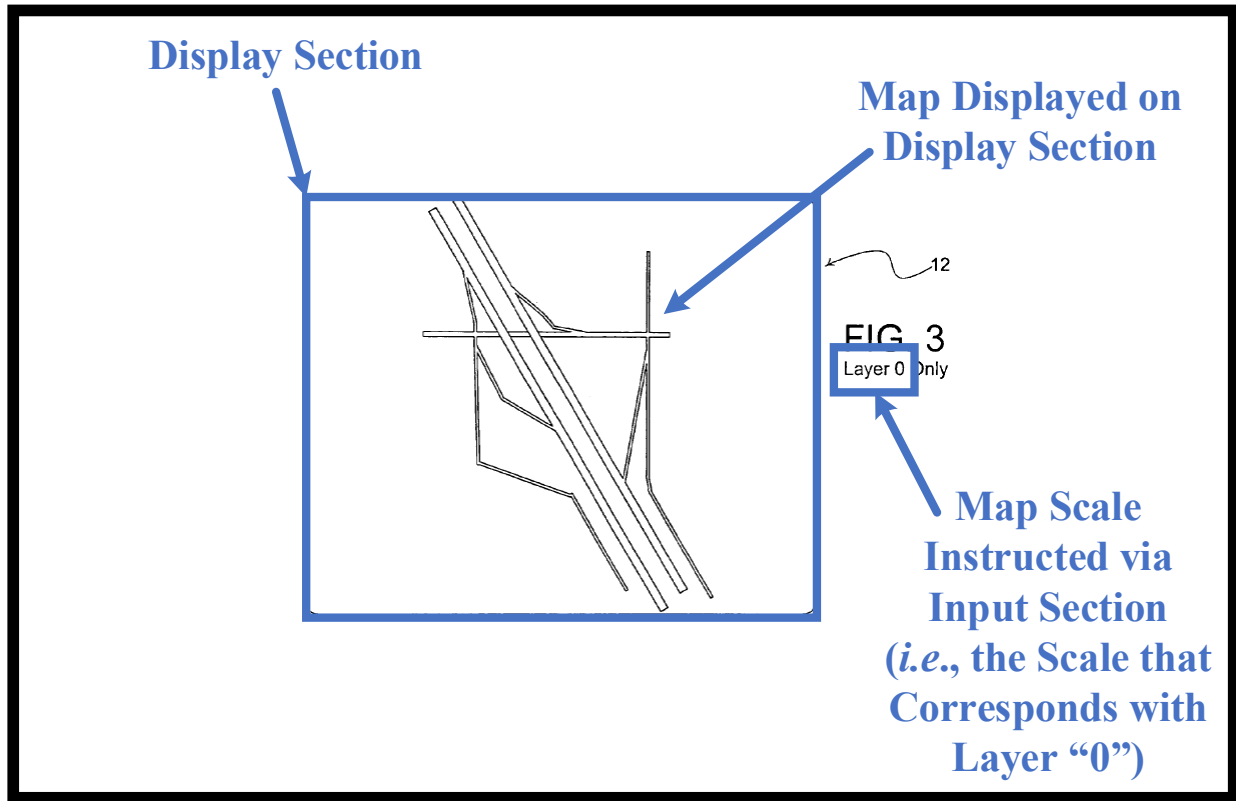
Accordingly, a POSITA would have been motivated to modify McDonough in view of Tanizaki to represent the destination that the driver set with a display element to beneficially provide a clear visual demarcation of the end of the guidance route and to help the driver find his or her destination (*e.g.*, by showing which side of the road the destination is on). (*Id.*) A POSITA would have had a reasonable expectation of success because the proposed modification would have required a routine, straightforward adjustment to McDonough’s map data (*e.g.*, adding a star icon to represent a destination) and McDonough already discloses placing icons at representative positions on a map. (*Id.*; EX1007 at FIG. 2.)

(g) McDonough Alone, Or In Combination With Huber, Renders Obvious Limitation [1f].

McDonough alone, or in combination with Huber, renders obvious limitation [1f].

McDonough discloses a procedure of displaying a map on the display 27 (*i.e.*, the display section) in accordance with one of the plurality of map scales (*i.e.*, the map scales that correspond with layers “0” to “4”) using a map display tool 40 running on processor 12. (EX1007 at 5:53-62, 6:9-33, 6:59-66, 7:1-9, 7:46-59, 8:17-

27, 10:7-18, 13:33-38, 15:25-32; *see also id.* at 2:3-9, 8:2-9; EX1003, ¶229.) Figure 3 of Huber, which is reproduced below, further illustrates this procedure:



(EX1008 at FIG. 3 (annotated); EX1003, ¶230.)

While McDonough does not expressly state how a map scale is set, it would have been obvious in view of McDonough alone to set the scale of the displayed map using McDonough's input section. (EX1003, ¶231.) McDonough teaches that its navigation system supports "zooming," which was a task typically performed using a user input device. (*Id.*; EX1007 at 5:54-60, 6:31-33, 8:5-9.) A POSITA would have known that using a user input device, such as McDonough's input section, to perform a zoom operation would have advantageously given the driver

control over the zoom operation and allowed the driver to set the map scale to his or her desired scale (*e.g.*, zooming in to better see certain map data elements or zooming out to be able to see the driver's entire guide route). (EX1003, ¶231.) Further, McDonough teaches that its input section is configured "to input information into the navigation system," and allowing the driver to input his or her desired map scale using the input section is consistent with this teaching. (EX1007 at 3:59-4:1; EX1003, ¶231.)

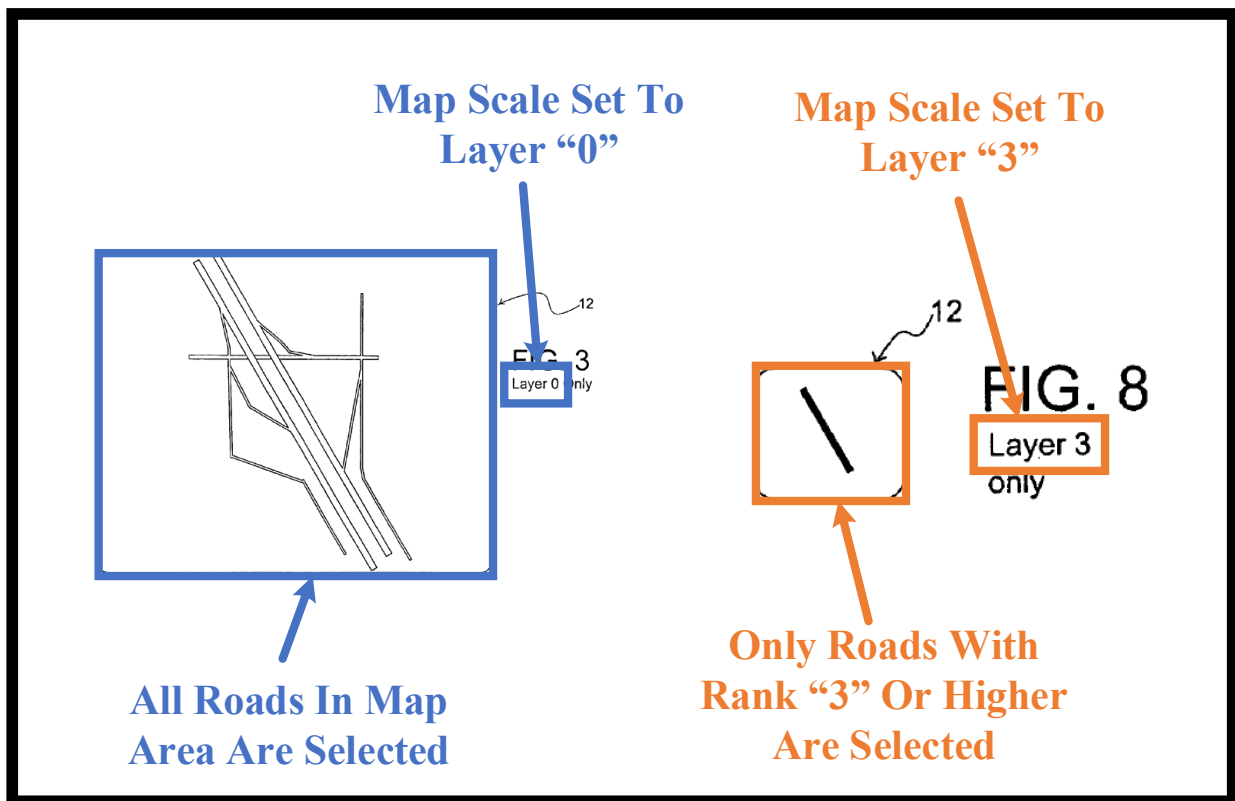
It also would have been obvious to set the scale of the displayed map using McDonough's input section in view of Huber's teachings clarifying that the driver sets the map scale using an input device. (*See* Section IV(B)(4), *supra*; *see also* EX1008 at 1:24-45, 1:57-60, 4:24-33, 4:55-57, 5:51-64, 6:32-35, 7:29-35 (teaching that the driver sets the map scale using an input device); EX1003, ¶232.)

(h) McDonough Discloses Limitation [1g].

McDonough discloses limitation [1g].

As discussed above with respect to limitation [1a], McDonough discloses storing attributes indicative of whether or not each of the roads in the map data should be displayed for each of a plurality of map scales. (EX1007 at 5:63-6:33; EX1003, ¶235.) McDonough further discloses that a map processing layer 42 of map display tool 40, which runs on processor 12, retrieves (*i.e.*, selects) roads from map database 30. (EX1007 at 8:17-27, 8:40-43, 8:66-9:3, 13:53-65; EX1003, ¶236.)

Roads are selected based on whether the stored road ranks (*i.e.*, attributes) indicate that the roads are displayable according to the instructed map layer (*i.e.*, map scale). (EX1003, ¶237; *see also* EX1007 at 6:9-33, 10:7-18.) For example, if the map scale is set to layer “3,” only roads with a rank of “3” or higher will be selected. (*Id.*) Figures 3 and 8 of Huber, which are reproduced below, further illustrate this selection process:



(EX1008 at FIGS. 3, 8 (annotated); EX1003, ¶238.)

McDonough also teaches that the map processing layer 42 selects points of interest (*i.e.*, city centers and facilities) for display based on their priorities (*i.e.*, ranks). (EX1003, ¶243.) McDonough teaches that points of interest in a map area

to be rendered are placed into a point of interest list 66. (EX1007 at 9:15-23, 16:49-50; EX1003, ¶239.) The point of interest list 66 may be presorted “according to point of interest priority information contained in the point of interest data retrieved from the map database.” (EX1007 at 16:60-64; EX1003, ¶240.) Alternatively, points of interest may be prioritized in a priority list 76. (EX1007 at 9:5-9, 16:57-60, 17:1-5; EX1003, ¶240.)

Next, map processing layer 42 selects for display names and icons (*i.e.*, display elements) in the point of interest list 66 according to their presorted priority order (or according to their priority order in the priority list 76). (EX1007 at 9:5-9, 16:57-60, 16:65-17:11, 18:14-24; *see also id.* at 15:25-38; EX1003, ¶241.) Each name/icon is processed in priority order and is selected for display as long as it will not overlap with a selected higher-priority name or icon. (EX1007 at 17:12-33, 18:4-13; *see also id.* at 9:23-28, 15:62-65; EX1003, ¶242.) Accordingly, map processing layer 42 selects display elements for display based on their priorities (*i.e.*, ranks). (EX1003, ¶243.)

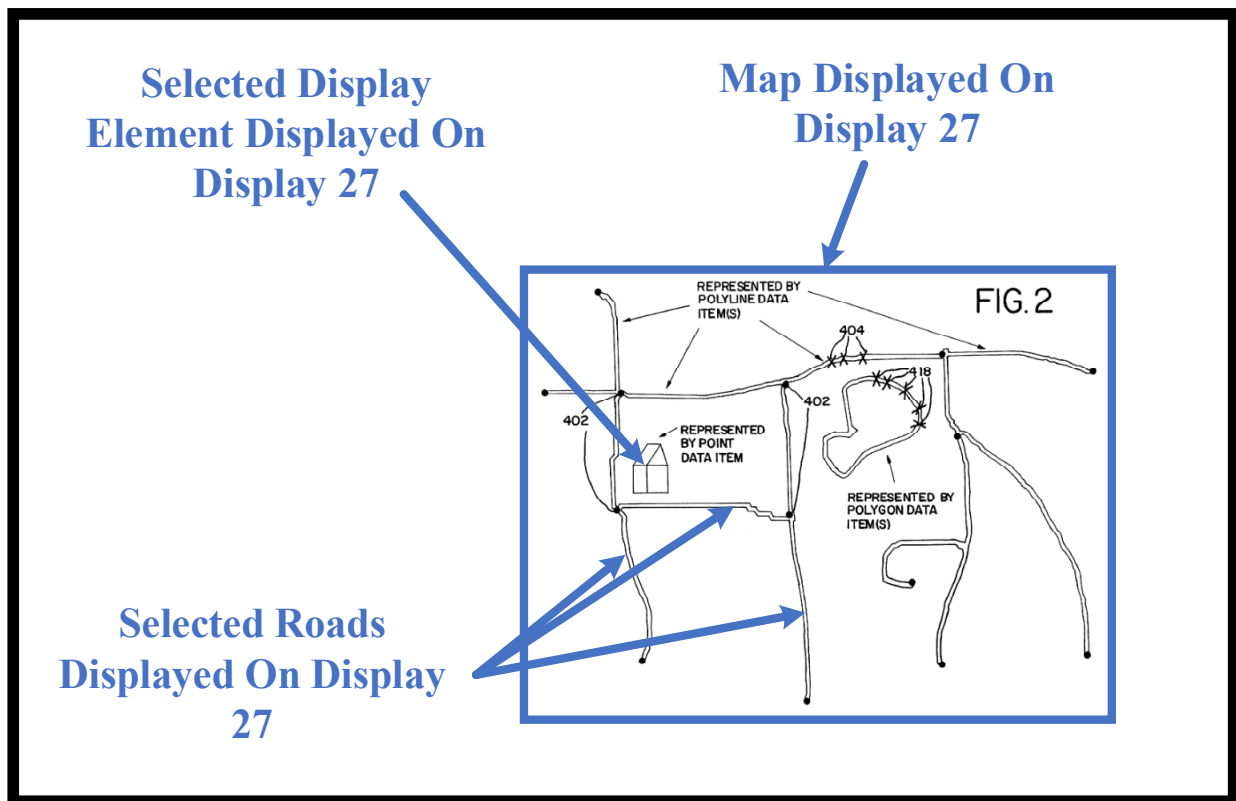
(i) McDonough In Combination With Tanizaki Teaches And Renders Obvious Limitation [1h].

As demonstrated in Section IV(B)(5), *supra*, a POSITA would have been motivated to modify McDonough in view of Tanizaki to further select each of the roads that is part of the calculated route but not indicated by the attributes as being displayable according to the instructed map scale. (EX1003, ¶244.)

(j) McDonough Discloses Limitation [1i].

McDonough discloses limitation [1i].

McDonough discloses that map display tool 40 running on processor 12 displays the selected roads and display elements on display 27 (*i.e.*, the display selection) as part of a map, as also shown below. (EX1007 at 6:59-66, 7:6-9, 7:51-59, 14:30-36, 14:53-56, 15:25-38, 19:31-32; EX1003, ¶247.)



(EX1007 at FIG. 2 (annotated).)

7. Challenged Claim 2.

McDonough alone renders obvious the additional limitations of Challenged Claim 2 (*i.e.*, displaying each selected road not indicated by the attributes as being displayable in a different way from the other selected roads).

Prior to the alleged invention of the ‘465 patent, it was common in the art to highlight, or display in a different color, the roads in a calculated guide route. (EX1003, ¶249.) A POSITA would have been motivated to display the roads in McDonough’s calculated route using highlighting (or a different color) to allow the driver to visually distinguish the roads in the calculated route from other roads in the displayed map area that are not part of the calculated route, which in turn would make it easier for the driver to follow the calculated route. (*Id.*) In the proposed modification, the selected roads that are part of the calculated route but not indicated by the attributes as being displayable according to the instructed map scale would be displayed in a fashion different from the other selected roads (*i.e.*, highlighted or colored lines vs. plain lines, respectively). (*Id.*, ¶250; *see also* EX1007 at FIG. 2 (showing selected roads displayed as plain lines).)

8. Challenged Claim 3.

McDonough in combination with Tanizaki teaches and renders obvious the additional limitations of Challenged Claim 3 (*i.e.*, performing route calculation

under a condition recommended by navigation or input by the user through the input section).

As discussed above with respect to limitation [1e], McDonough in combination with Tanizaki discloses and renders obvious performing a route calculation between an own-vehicle position and a selected display element (*i.e.*, a star representing a destination). (EX1003, ¶253.)

McDonough further discloses that the route calculation is performed under a condition recommended by the navigation system. (EX1003, ¶254.) Specifically, McDonough teaches that the “navigation system can examine various routes between two locations to determine an optimum route to travel from a starting location to a destination location in the geographic region.” (*Id.*; EX1007 at 1:14-17; *see also id.* at 1:9-12, 1:17-22.) Route calculation is therefore performed under a condition recommended by the navigation system (*i.e.*, a condition that determines the “optimum route” out of the various possible routes to the destination). (*Id.*)

It also would have been obvious to a POSITA to modify McDonough’s navigation system to calculate a route according to a driver-input condition to beneficially allow the driver to incorporate his or her preferences into the calculation of the “optimum route” (*e.g.*, a preference for avoiding tollways), as was well-known in the art before the alleged invention of the ‘465 patent. (EX1003, ¶255.)

A POSITA would have had a reasonable expectation of success because algorithms for calculating an “optimum route” (optionally in accordance with driver preferences) were well-known and well understood prior to the alleged invention of the ‘465 patent, and these functions came standard in prior art navigation systems. (*Id.*) McDonough’s teaching that the navigation system can use “input from the end-user” to determine an “optimum route” is also consistent with, and suggests, calculating a route according to a driver-input condition. (*Id.*; EX1007 at 1:12-17.)

9. McDonough In Combination With Huber And Tanizaki Renders Obvious Challenged Claim 5.

(a) McDonough Discloses Limitation [5-PRE].

McDonough discloses limitation [5-PRE].

Limitation [5-PRE] combines limitations [1-PRE] through [1d]. The only material differences between limitation [5-PRE] and limitations [1-PRE] through [1d] are that limitation [5-PRE] additionally requires:

- (i) “a display method of a road network”;
- (ii) “a position information acquiring section for obtaining position information on a vehicle”; and
- (iii) “a drawing memory.”

(EX1011.)

As shown above, McDonough discloses limitations [1-PRE] through [1d] and, therefore, limitation [5-PRE] (with the exception of the aforementioned three differences).

As shown below, McDonough also discloses each of the three differences between limitation [5-PRE] and limitations [1-PRE] through [1d].

First, McDonough discloses a “display method of a road network.” McDonough teaches a display method of a road network. (EX1007 at 6:59-66, 7:6-9, 7:51-59, 14:53-56, 15:25-38, 19:31-32, FIG. 2; EX1003, ¶260.)

Second, McDonough discloses a “position information acquiring section for obtaining position information on a vehicle.” McDonough teaches that navigation system 10 has a positioning system 24 (*i.e.*, a position information acquiring section) for obtaining a vehicle’s position. (EX1007 at 1:8-28, 3:45-57, 6:44-55; EX1003, ¶261.)

Third, McDonough discloses a control section including “a drawing memory.” McDonough discloses that a map object 52 of processor 12 includes a graphics buffer. (EX1007 at FIG. 9 (at reference numerals 67, 68), 9:10-16; EX1003, ¶262.) Map data is drawn and stored on the graphics buffer. (EX1007 at FIG. 20 (reference numeral 228), 6:63-66, 7:54-59, 12:36-39, 13:7-10, 14:53-56, 15:16-17, 15:32-33, 18:40-43, 19:31-33, claim 21; *see also id.* at 2:20-22, 9:13-16, claim 5, claim 7, claim 15; EX1003, ¶262.) The map data that is drawn and stored

on the graphics buffer is used to create a map that is then sent to display 27. (EX1007 at 6:59-66, 7:6-9, 7:51-59, 12:33-41, 14:30-36, 14:53-56, 15:25-38, 19:31-32; EX1003, ¶262.) Thus, a POSITA would have understood that McDonough's graphics buffer is a drawing memory. (EX1003, ¶262.)

(b) McDonough In Combination With Tanizaki Teaches And Renders Obvious Limitation [5a].

There are no material differences between limitation [5a] and limitation [1e]. (EX1011.) Thus, for the same reasons discussed above, McDonough in combination with Tanizaki teaches and renders obvious limitation [5a].

(c) McDonough Alone, Or In Combination With Huber, Renders Obvious Limitation [5b].

As discussed above with respect to limitation [1f], McDonough alone, or in combination with, Huber renders obvious displaying, according to one of a plurality of map scales designated by the user via the input section, a map on display 27 (*i.e.*, the display section). (EX1003, ¶266.) McDonough further discloses that, prior to displaying the map on display 27, the map is first drawn on the graphics buffer (*i.e.*, the drawing memory). (*Id.*, ¶267; EX1007 at FIG. 20 (reference numeral 228), 6:63-66, 7:51-59, 12:36-39, 13:7-10, 14:53-56, 15:16-17, 15:32-33, 19:31-33, claim 21.)

(d) McDonough Discloses Limitation [5c].

McDonough discloses limitation [5c].

As discussed above with respect to limitation [1g], McDonough discloses selecting the roads indicated by the attributes as being displayable according to a

driver-designated map scale. (EX1003, ¶270.) McDonough further discloses obtaining an own-vehicle position using positioning system 24 (*i.e.*, the position information acquiring section). (*Id.*, ¶271; EX1007 at 1:8-28, 3:45-57, 6:44-55.) A POSITA would have understood that when the own-vehicle position obtained by positioning system 24 (*i.e.*, the position information acquiring section) is on a road with a rank that is greater than or equal to the selected map layer (*i.e.*, map scale), the selected roads will include the obtained own-vehicle position (*i.e.*, the road on which the vehicle is currently positioned). (EX1003, ¶271; *see also* EX1007 at 6:9-33, 8:19-27, 10:7-18, 15:25-38.)

(e) McDonough Discloses Limitation [5d].

McDonough discloses limitation [5d].

McDonough discloses drawing the selected roads and one or more display elements on the graphics buffer (*i.e.*, the drawing memory). (EX1007 at FIG. 20 (reference numeral 228), 6:59-66, 7:51-59, 12:36-39, 13:7-10, 14:30-36, 14:53-56, 15:16-17, 15:25-38, 19:31-33, claim 21; *see also id.* at FIG. 2 (showing map with selected roads and display element); EX1003, ¶273.)

(f) McDonough In Combination With Tanizaki Teaches And Renders Obvious Limitation [5e].

As demonstrated in Section IV(B)(5), *supra*, a POSITA would have been motivated to modify McDonough in view of Tanizaki to further select each of the roads that is part of the calculated route (which is produced as a result of the route

calculation) but not indicated by the attributes as being displayable according to the designated map scale, and to draw those roads on McDonough's graphics buffer (*i.e.*, drawing memory). (EX1003, ¶275.)

(g) McDonough Discloses Limitation [5f].

McDonough discloses limitation [5f].

McDonough discloses displaying the road network drawn on the graphics buffer (*i.e.*, drawing memory) on display 27 (*i.e.*, the display section). (EX1007 at 2:19-30, 12:33-41, 18:40-47, 20:44-45; *see also id.* at 6:59-66, 7:51-59, 13:7-10, claim 21; EX1003, ¶278.)

V. DISCRETIONARY DENIAL IS UNWARRANTED

A. *Fintiv*.

Patent Owner has asserted the '465 patent against Petitioner in the litigation currently pending in the Eastern District of Texas (*i.e.*, *Mel NavIP LLC v. Hyundai Motor Company et al.*, 2:23-cv-00176 (E.D. Tex.) (the "Litigation")). The Board should not exercise its discretion to deny institution because the Petition presents compelling evidence of unpatentability. Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022) ("*Fintiv* Memo") at 2, 9. Consideration of all the *Fintiv* factors also supports that the Board should decline to exercise its discretion to deny institution.

Factor 1: This factor is neutral because Petitioner has not yet moved for a stay in the Litigation and the court has not yet considered entering a stay.

Factor 2: This factor weighs against discretionary denial or is neutral at worst because the final written decision is expected to issue around the same time as the trial date in the Litigation. In the Litigation, a trial date has been scheduled for March 3, 2025. (EX1028 at 1.) Based on the filing date of the Petition, a final written decision is expected by May 2025, a mere two months after the current trial date. This two-month difference is insignificant as court deadlines often change and the anticipated trial date is well over a year away. *See Fintiv* Memo at 8.

Factor 3: This factor weighs against discretionary denial because the Litigation is in its infancy, the parties have invested very little in the case, and Petitioner was diligent in filing its Petition. Fact discovery has only just begun, the parties conducted their Rule 26(f) conference on October 11, 2023, and the court entered its scheduling order on October 16, 2023. (EX1028 at 1.) There has been no claim construction briefing or *Markman* hearing, the court has not entered a claim construction opinion or any substantive orders relating to the '465 patent or the invalidity issues raised in the Petition, and Petitioner provided its initial invalidity contentions just days ago. (*Id.* at 3-4.) A claim construction order will not issue until well after the institution decision. (*Id.* at 3 (setting *Markman* hearing for September 18, 2024).) Petitioner was also very diligent in preparing and filing the Petition as the Petition was filed just two months after Patent Owner served its

infringement contentions and well in advance of the statutory deadline (*i.e.*, April 21, 2024). (*Id.* at 5.)

Factor 4: This factor weighs against discretionary denial in view of the following stipulation, which confirms that there will be no overlap between the invalidity issues and prior art raised in the Petition and the invalidity issues and prior art litigated in the Litigation:

Petitioner and its real parties-in-interest hereby stipulate that, in the event the PTAB institutes an *inter partes* review based on this Petition, Petitioner and its real parties-in-interest will not rely on the same Grounds and References (*i.e.*, Yokota, McDonough, Huber, and Tanizaki) asserted in this Petition to challenge the validity of the Challenged Claims of the ‘465 patent in the Litigation.

Petitioner’s invalidity contentions in the Litigation also contain numerous prior art references (including prior art systems), obviousness combinations, and statutory invalidity grounds (*i.e.*, 35 U.S.C. §§ 101 and 112) that are not at issue in the Petition.

Factor 5: This factor is neutral as it is typical for a petitioner in an *inter partes* review and a defendant in a parallel district court proceeding to be the same.

Factor 6: This factor weighs against discretionary denial because the Petition sets forth compelling evidence of unpatentability. (*See* Sec. I-IV, *supra.*) “[T]he PTAB will not deny institution [] under *Fintiv* (i) when a petition presents compelling evidence of unpatentability.” *Fintiv* Memo at 9. Here, the evidence

presented in the Petition, “if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable.” *Id.* at 4. Further, Ground 1 is a single-reference obviousness ground demonstrating how Yokota alone renders obvious all of the Challenged Claims. Thus, discretionary denial is inappropriate in view of the compelling evidence of unpatentability presented in the Petition.

B. *Advanced Bionics.*

The Board should decline to exercise its discretion to deny institution under 35 U.S.C. § 325(d) for at least two reasons.

First, the art and arguments set forth in the Petition are not the same or substantially the same as those presented to the PTO during prosecution of the ‘465 patent. As noted above, the Petition sets forth two Grounds of unpatentability: (i) Yokota in combination with the knowledge of a POSITA; and (ii) McDonough in combination with Huber and Tanizaki. While Yokota was cited by the Applicant during prosecution in a July 21, 2009, information disclosure statement (“IDS”), none of the Ground 2 references were before the Examiner during prosecution. (*See* EX1001 at [56]; EX1002 at 9-12.) Thus, the Board need not consider the second part of the *Advanced Bionics* framework. *Reflex USA LLC v. Longyear TM, Inc.*, Case IPR2023-00642, Paper 11 at 14-20 (PTAB Sept. 26, 2023).

Second, even if the Board finds that the same or substantially the same art or arguments were previously before the PTO (they were not), the Petition

demonstrates that the PTO erred in a manner material to the patentability of the Challenged Claims.

Yokota was never used in a rejection of any claims of the ‘465 patent, the Applicant never made any arguments regarding Yokota during prosecution, the Examiner never evaluated Yokota in response to any of the Applicant’s arguments, and the Examiner’s Notice of Allowability does not reference Yokota. (EX1002 at 224-227, 237-244, 248-252.) The Examiner did not sufficiently evaluate or appreciate the relevance of Yokota. That the Applicant made substantial material changes to the pending claims after the Examiner noted that he considered Yokota further supports that the Examiner did not sufficiently evaluate or appreciate Yokota. (*Id.* at 231, 238-240.)

The Petition and supporting expert declaration also demonstrate that the Challenged Claims are obvious over Yokota and that Yokota discloses and suggests “display[ing] a road segment which is included in the calculated route, but not indicated as being displayable at the current scale by its rank/attribute”—the very limitation that the Applicant asserted was missing from the prior art. (EX1002 at 242-243; *see also id.* at 248 (Examiner allowing the pending claims in view of the Applicant’s arguments and claim amendments).) The Petition and supporting expert declaration thus demonstrate how the Examiner erred in any evaluation of Yokota and are strong on the merits. Discretionary denial is unwarranted on these facts.

See, e.g., Nespresso USA, Inc. v. K-Fee System GMBH, Case IPR2023-00485, Paper 9 at 37-39 (PTAB Sept. 13, 2023).

VI. MANDATORY NOTICES UNDER 37 C.F.R. §42.8(a)(1)

A. Real Party-in-Interest Under 37 C.F.R. §42.8(b)(1)

The real parties-in-interest in this Petition are as follows:

- Hyundai Motor Company;
- Hyundai Motor America;
- Hyundai Capital America;
- Kia Corporation; and
- Kia America, Inc.

B. Related Matters Under 37 C.F.R. §42.8(b)(2)

The following pending federal district court litigations may affect or be affected by a decision in this proceeding:

- *Mel NavIP LLC v. Hyundai Motor Company et al.*, 2:23-cv-00176 (E.D. Tex.); and
- *Mel NavIP LLC v. General Motors Company et al.*, 2:23-cv-00175 (E.D. Tex.).

The undersigned is unaware of any other any other judicial or administrative matter that would affect, or be affected by, a decision in this proceeding.

C. Lead and Back-up Counsel Under 37 C.F.R. §42.8(b)(3) and Service Information under 37 C.F.R. §42.8(b)(4)

Petitioner designates the following lead and backup counsel:

Lead Counsel	Back-up Counsel
James J. Lukas, Jr. (Reg. No. 59,114) GREENBERG TRAURIG, LLP 77 West Wacker Drive Suite 3100 Chicago, IL 60601 Telephone: (312) 456-8400 Facsimile: (312) 456-8435 lukasj@gtlaw.com	Trenton A. Ward (Reg. No. 59,157) GREENBERG TRAURIG, LLP 3333 Piedmont Road NE, Suite 2500 Atlanta, GA 30305 Telephone: 404-434-0741 trenton.ward@gtlaw.com Benjamin Gilford (Reg. No. 72,072) GREENBERG TRAURIG, LLP 77 W. Wacker Drive, Suite 3100 Chicago, IL 60601 Telephone: 312-456-8400 Facsimile: 312-456-8450 gilfordb@gtlaw.com Erik M. Bokar (<i>pro hac vice forthcoming</i>) GREENBERG TRAURIG, P.A. 450 S. Orange Avenue, Suite 650 Orlando, FL 32801 Telephone: (407) 420-1000 Facsimile: (407) 420-5909 bokare@gtlaw.com Olivia C. Mathews (Reg. No. 80,801) GREENBERG TRAURIG, LLP 77 Wacker Drive, Suite 3100 Chicago, IL 60601 Telephone: (312) 456-8400 Facsimile: (312) 456-8435 Olivia.mathews@gtlaw.com

Service on Petitioner may be made by mail or hand delivery to: Greenberg Traurig, LLP, 77 West Wacker Drive, Suite 3100, Chicago, IL 60601. Petitioner consents to and prefers electronic service by emailing counsel of record at the email addresses shown above.

VII. CERTIFICATION OF WORD COUNT UNDER 37 C.F.R. §42.24(d)

Petitioner certifies that the word count in this Petition is 13,984 words, as counted by the word-processing program (Microsoft Word for Office 365) used to generate this Petition, where such word count excludes the claims listing, table of contents, mandatory notices, certificate of service, appendix of exhibits, and this certificate of word count. This Petition is in compliance with the 14,000 word limit set forth in 37 C.F.R. §42.24(a)(1)(i).

VIII. CONCLUSION

Petitioner respectfully requests that *inter partes* review of the ‘465 patent be instituted and the Challenged Claims be cancelled as unpatentable.

Respectfully submitted,
GREENBERG TRAURIG, LLP

Date: November 17, 2023

By: /s/ James J. Lukas, Jr.
James J. Lukas, Jr.

Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned certifies that a true and correct copy of the Petition together with all exhibits identified in the above Table of Exhibits and Petitioner's Power of Attorney, have been served on the Patent Owner via Priority Mail Express or by means at least as fast and reliable as Priority Mail Express on the below date, at the following addresses:

BIRCH STEWART KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
Falls Church, VA 22042-1248
UNITED STATES

Respectfully submitted,
GREENBERG TRAURIG, LLP

Date: November 17, 2023

By: /s/ James J. Lukas, Jr.
James J. Lukas, Jr.

Counsel for Petitioner