

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. 8,649,971 to Machino

Case No.: IPR2024-00173

**PETITION FOR *INTER PARTES* REVIEW OF
CLAIMS 1-4, 7-12, 14, 16-17, AND 19 OF U.S. PATENT
8,649,971 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§
42.100 ET SEQ.**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	GROUND FOR STANDING UNDER 37 C.F.R. §42.104	1
III.	BACKGROUND	1
A.	The ‘971 Patent	1
B.	The Challenged Claims Of The ‘971 Patent.	3
C.	Priority Date	4
D.	The Prosecution History Of The ‘971 Patent.....	4
E.	A Person of Ordinary Skill in the Art (“POSITA”).....	4
F.	Claim Construction	5
IV.	SPECIFIC GROUNDS OF UNPATENTABILITY	5
A.	GROUND 1: Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Challenged Claims 1-2, 7-12, 16-17, And 19.	5
1.	Overview Of U.S. Patent No. 7,054,742 (“Khavakh”).....	5
2.	Overview Of U.S. Patent No. 5,243,528 (“Lefebvre”).....	7
3.	Motivation To Combine Khavakh With Lefebvre.....	9
4.	Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Independent Challenged Claims 1 And 19.	19
(a)	Khavakh Discloses “A navigation device” (“Limitation [1-PRE]”) And “A navigation method performed by utilizing a navigation apparatus” (“Limitation [19-PRE]”).....	20
(b)	Khavakh Discloses “a setting unit configured to set waypoints and a destination” (“Limitation [1a]”) And “setting, by utilizing a setting unit of the navigation apparatus, waypoints and a destination” (“Limitation [19a]”).....	22

- (c) Khavakh Discloses “a route searching unit configured to search for a whole route leading to the destination via the waypoints set by said setting unit” (“Limitation [1b]”) And “searching, by utilizing a route searching unit of the navigation apparatus, for a whole route leading to the destination via the waypoints set by said setting step” (“Limitation [19b]”). 25
- (d) Khavakh Discloses “a route guidance unit configured to carry out route guidance according to the whole route which is searched for by said route searching unit” (“Limitation [1c]”) And “carrying out, by utilizing a route guidance unit of the navigation apparatus, route guidance according to the whole route which is searched for by said route searching step” (“Limitation [19c]”). 27
- (e) Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Teaches And Renders Obvious “an output unit configured to output a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when said route guidance unit determines that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint” (“Limitation [1d]”) And “outputting, by utilizing an output unit of the navigation apparatus, a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when, by said route guidance step, it is determined that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint” (“Limitation [19d]”). 30

(f)	Khavakh In Combination With Lefebvre Teaches And Renders Obvious “an input unit configured to input a command indicating whether or not to travel via said first next waypoint in response to the message outputted by said output unit” (“Limitation [1e]”) And “inputting, by utilizing an input unit of the navigation apparatus, a command indicating whether or not to travel via said first next waypoint in response to the outputted message” (“Limitation [19e]”).	42
5.	Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Dependent Challenged Claims 2, 7-12, And 16-17.	48
(a)	Challenged Claim 2.	48
(b)	Challenged Claim 7.	48
(c)	Challenged Claim 8.	49
(d)	Challenged Claim 9.	50
(e)	Challenged Claim 10.	52
(f)	Challenged Claim 11.	53
(g)	Challenged Claim 12.	54
(h)	Challenged Claim 16.	54
(i)	Challenged Claim 17.	55
B.	GROUND 2: Khavakh In Combination With Lefebvre, RDX, And The Knowledge Of A POSITA Renders Obvious Challenged Claims 3-4 And 14.	57
1.	Overview Of RDX.	57
2.	Motivation To Combine Khavakh And Lefebvre With RDX.	59
3.	Challenged Claim 3.	63
4.	Challenged Claim 4.	65
5.	Challenged Claim 14.	67
V.	DISCRETIONARY DENIAL IS UNWARRANTED	69
A.	Fintiv.	69

B.	Advanced Bionics.....	72
VI.	MANDATORY NOTICES UNDER 37 C.F.R. §42.8(a)(1).....	72
A.	Real Party-in-Interest Under 37 C.F.R. §42.8(b)(1).	72
B.	Related Matters Under 37 C.F.R. §42.8(b)(2).	73
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).....	73
VII.	CERTIFICATION OF WORD COUNT UNDER 37 C.F.R. §42.24(d)	74
VIII.	CONCLUSION.....	75

TABLE OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 8,649,971 (“the ‘971 patent”)
1002	File history of U.S. Patent No. 8,649,971
1003	Declaration of David H. Williams
1004	Curriculum Vitae of David H. Williams
1005	U.S. Patent No. 7,054,742 to Khavakh et al. (“Khavakh”)
1006	U.S. Patent No. 5,243,528 to Lefebvre (“Lefebvre”)
1007	2008 RDX Navigation Manual (Unlinked) (“RDX”)
1008	Chart comparing the limitations of Challenged Claims 1 and 19 of the ‘971 patent
1009	Exhibit D to MEL NavIP LLC’s Infringement Contentions in <i>MEL NavIP LLC v. Hyundai Motor Company et al.</i> , Case No. 23-cv-00176 (E.D. Tex.)
1010	Exhibit C 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.)
1011	MEL NavIP LLC’s Response-in-Opposition to Toyota’s Motion to Dismiss in <i>MEL NavIP LLC v. Toyota Motor North America, Inc. et al.</i> , Case No. 22-cv-00152 (E.D. Tex.)
1012	Declaration of Dr. Sylvia Hall-Ellis
1013	Curriculum Vitae of Dr. Sylvia Hall-Ellis
1014	U.S. Patent No. 5,262,775 to Tamai et al.
1015	U.S. Patent No. 5,757,289 to Nimura et al.
1016	Pioneer AVIC-Z1 Operation Manual
1017	European Patent No. EP1146496B1
1018	European Patent No. EP1611416B1
1019	U.S. Patent No. 7,149,625 to Mathews et al.
1020	U.S. Patent App. Pub. No. 2006/0116818 to Chao et al.

Exhibit	Description
1021	Docket Control Order in <i>MEL NavIP LLC v. Hyundai Motor Company et al.</i> , Case No. 23-cv-00176 (E.D. Tex.)
1022	U.S. Patent No. 7,643,917 to Kolletzki
1023	Canadian Patent App. Pub. No. CA2511765A1

CLAIMS LISTING

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

[1a] a setting unit configured to set waypoints and a destination;

[1b] a route searching unit configured to search for a whole route leading to the destination via the waypoints set by said setting unit;

[1c] a route guidance unit configured to carry out route guidance according to the whole route which is searched for by said route searching unit;

[1d] an output unit configured to output a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when said route guidance unit determines that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint; and

[1e] an input unit configured to input a command indicating whether or not to travel via said first next waypoint in response to the message outputted by said output unit.

[Claim 2] The navigation device according to claim 1, wherein when the command is inputted from the input unit, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route.

[Claim 3] The navigation device according to claim 1, wherein when the command indicating that the vehicle does not travel via the first next waypoint is inputted, the

output unit outputs a waypoint list in which a list of the waypoints set by the setting unit is shown, and the route searching unit re-searches for a new whole route according to a new waypoint list which is acquired by changing the waypoint list outputted by said output unit by using said input unit.

[Claim 4] The navigation device according to claim 1, wherein when the command indicating that the vehicle does not travel via the first next waypoint is inputted, the route searching unit re-searches for a new whole route leading to the destination via another waypoint when the other waypoint exists forward of the first next waypoint, or re-searches for a new whole route leading to the destination when no other waypoint exists forward of the first next waypoint.

[Claim 7] The navigation device according to claim 1, wherein when the command indicating that the vehicle travels via the first next waypoint is inputted, the route searching unit re-searches for a new whole route leading to the destination via said first next waypoint.

[Claim 8] The navigation device according to claim 1, wherein the output unit includes a display unit, and the input unit inputs the command according to either pushing down of a button displayed on a screen of said display unit, or voice.

[Claim 9] The navigation device according to claim 1, wherein when the command is not inputted from the input unit even if a predetermined period of time has elapsed after the output unit outputs the message showing that the vehicle has deviated from

the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route.

[Claim 10] The navigation device according to claim 1, wherein when the route guidance unit determines that the vehicle has deviated from the route to the predetermined distance or more in a state in which the output unit outputs the message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route.

[Claim 11] The navigation device according to claim 9, wherein the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint.

[Claim 12] The navigation device according to claim 10, wherein the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint.

[Claim 14] The navigation device according to claim 10, wherein the route searching unit re-searches for a new whole route leading to the destination via another waypoint when the other waypoint exists forward of the first next waypoint, or re-searches for a new whole route leading to the destination when no other waypoint exists forward of the first next waypoint.

[Claim 16] The navigation device according to claim 1, wherein when the command is not inputted from the input unit even if a predetermined period of time has elapsed after the output unit outputs the message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint, a new whole route leading to the destination via another waypoint when the other waypoint exists forward of said first next waypoint, or a new whole route leading to the destination when no other waypoint exists forward of said first next waypoint.

[Claim 17] The navigation device according to claim 1, wherein when the command is not inputted from the input unit even if the vehicle travels a fixed distance after the output unit outputs the message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint, a new whole route leading to the destination via another waypoint when the other waypoint exists forward of said first next waypoint, or a new whole route leading to the destination when no other waypoint exists forward of said first next waypoint.

[Claim 19, 19-PRE] A navigation method performed by utilizing a navigation apparatus, comprising:

[19a] setting, by utilizing a setting unit of the navigation apparatus, waypoints and a destination;

[19b] searching, by utilizing a route searching unit of the navigation apparatus, for a whole route leading to the destination via the waypoints set by said setting step;

[19c] carrying out, by utilizing a route guidance unit of the navigation apparatus, route guidance according to the whole route which is searched for by said route searching step;

[19d] outputting, by utilizing an output unit of the navigation apparatus, a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when, by said route guidance step, it is determined that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint; and

[19e] inputting, by utilizing an input unit of the navigation apparatus, a command indicating whether or not to travel via said first next waypoint in response to the outputted message.

I. INTRODUCTION

Hyundai Motor Company (“Petitioner”) seeks *inter partes* review (“IPR”) and cancellation of claims 1-4, 7-12, 14, 16-17, and 19 (collectively, “the Challenged Claims”) of U.S. Patent No. 8,649,971 (“the ‘971 patent”).

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

Petitioner certifies that the ‘971 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	‘971 Patent Claims	Basis for Obviousness
Ground 1	1-2, 7-12, 16-17, and 19	Khavakh in combination with Lefebvre and the knowledge of a POSITA
Ground 2	3-4 and 14	Khavakh in combination with Lefebvre, RDX, and the knowledge of a POSITA

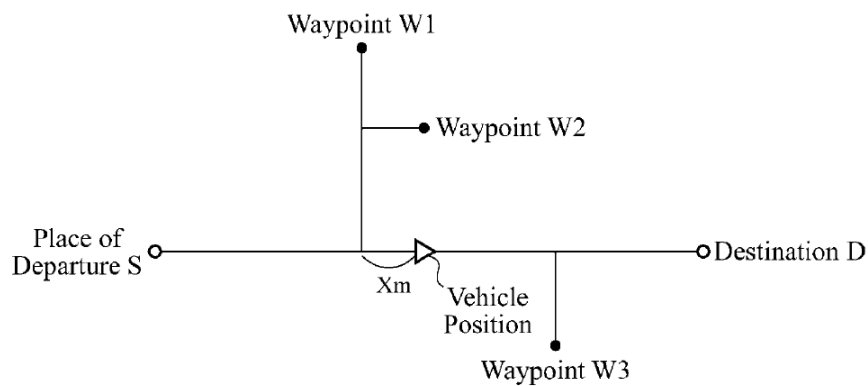
III. BACKGROUND

A. The ‘971 Patent

The ‘971 patent “relates to a navigation device that carries out route guidance of a route including waypoints acquired through a route search.” (EX1001 at 1:5-

10.)¹ In one example of the operation of the '971 patent's navigation device, a vehicle traveling along a route comprising departure point "S," waypoints W1-W3, and destination "D" deviates from the portion of the route leading to first next waypoint W1 by a predetermined distance of "X" meters. (*Id.* at 5:48-63, 8:22-31.)

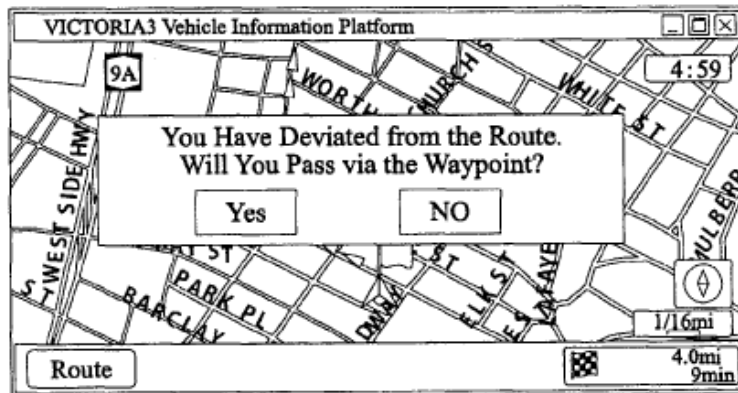
FIG.2



(*Id.* at FIG. 2.)

When the navigation device determines that the vehicle has deviated from the route by the predetermined distance and that the vehicle is on the route after the first next waypoint (*i.e.*, waypoint W1), the navigation device outputs a "message" showing that the vehicle has deviated from the route. (*Id.* at 8:36-45, 8:60-67.) An example of the "message" is shown below:

¹ A waypoint is an intermediate point or stop along a calculated route. (EX1001 at 2:1-4, 5:50-54.)



(*Id.* at FIG. 7.)

In response to the output unit 18 displaying the “message,” a command indicating whether or not to travel via the first next waypoint W1 may be input into the navigation device using the input unit 17. (*Id.* at 9:24-37, 9:46-67.) Depending on the command, the navigation device can either: (i) re-search for a route to the destination that includes the first next waypoint W1; or (ii) re-search for a route to the destination that skips the first next waypoint W1. (*Id.*)

The ‘971 patent asserts that the point of novelty between the prior art and the ‘971 patent is that the claimed invention of the ‘971 patent allows the driver to determine how to handle a route deviation (as opposed to automatically determining how to handle a route deviation). (*Id.* at 1:13-62.)

B. The Challenged Claims Of The ‘971 Patent.

Of the Challenged Claims, only Challenged Claims 1 and 19 are independent. (EX1001 at claims 1, 19.) Challenged Claim 1 is directed to an apparatus (*i.e.*, a “navigation device”), while Challenged Claim 19 is directed to a method performed

using the apparatus of Challenged Claim 1. (*Id.*) There are no material differences between Challenged Claims 1 and 19. (EX1008; EX1003, ¶74.)

C. Priority Date

The ‘971 patent claims priority to a Japanese patent application filed on April 2, 2008. (EX1001 at [30].) For the purposes of this proceeding, Petitioner does not dispute the ‘971 patent’s claimed priority date.

D. The Prosecution History Of The ‘971 Patent.

On October 15, 2012, the Examiner issued a non-final office action rejecting pending claims 1-18 as obvious over Sugiura (U.S. Patent App. Pub. No. 2004/0044464) in view of Hayashida (U.S. Patent No. 5,926,118). (EX1002 at 471.) In response, the Applicant argued that Sugiura and Hayashida do not teach or suggest displaying a “message” showing that a vehicle has deviated from a route. (*Id.* at 505, 507.) The Examiner subsequently issued a Notice of Allowance. (*Id.* at 581.) According to the Examiner’s Reasons for Allowance, the prior art of record failed to teach or suggest a navigation device and method comprising “outputting a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading...” (*Id.* at 590.)

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

A POSITA in the field of the ‘971 patent as of the ‘971 patent’s earliest effective filing date (*i.e.*, April 2, 2008) 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: Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Challenged Claims 1-2, 7-12, 16-17, And 19.

1. Overview Of U.S. Patent No. 7,054,742 (“Khavakh”).

Khavakh issued on May 30, 2006, and is thus prior art to the ‘971 patent under pre-AIA §102(b). (EX1005 at [45].) Khavakh was not cited during the prosecution of the ‘971 patent.

Khavakh is directed to a navigation system 10 that is installed in a vehicle 11, such as a car or truck. (*Id.* at 3:36-38.) The navigation system 10 includes, among other things, a processor 12, a memory storage device 16 for storing a navigation software program 18, and a user interface 31 for allowing the user (*i.e.*, driver) to input information into the navigation system, such as a request for a route to a desired destination. (*Id.* at 3:47-53, 4:8-13.) The driver may also specify one or more

intermediate waypoints for the route to pass through. (*Id.* at 9:39-47, 10:57-60, 12:12-18.)

Once the destination and intermediate waypoint(s) have been specified, a route calculation tool 40 calculates an entire solution route from the origin to the destination that includes all the intermediate waypoint(s). (*Id.* at 6:15-18, 13:56-61, 22:55-23:3, 29:41-43, 32:35-54.) A route guidance tool 91 then guides the driver to the intermediate waypoint(s) and destination according to the calculated solution route. (*Id.* at 5:49-58, 7:16-22, 17:37-44, claim 8.)

Khavakh also teaches an “improved rerouting feature” that “may be used when the vehicle in which the navigation system is installed departs from the originally calculated solution route as the vehicle is traveling.” (*Id.* at 29:35-40; *see also id.* at 29:54-62, 30:7-14.) Khavakh’s rerouting feature “prompts the end-user to indicate whether he or she wants a new route (e.g., a re-route) to be calculated.” (*Id.* at 30:17-20; *see also id.* at claim 9.)

Khavakh is analogous art to the ‘971 patent because Khavakh is in the same field of endeavor as the ‘971 patent (*i.e.*, navigation devices that carry out route guidance) and is reasonably pertinent to a problem addressed by the ‘971 patent (*i.e.*, allowing the driver to decide how to respond to an off route condition). (EX1001 at 1:5-10, 1:48-62; EX1005 at 1:17-18, 3:36-44, 30:17-20, claim 9; EX1003, ¶81).

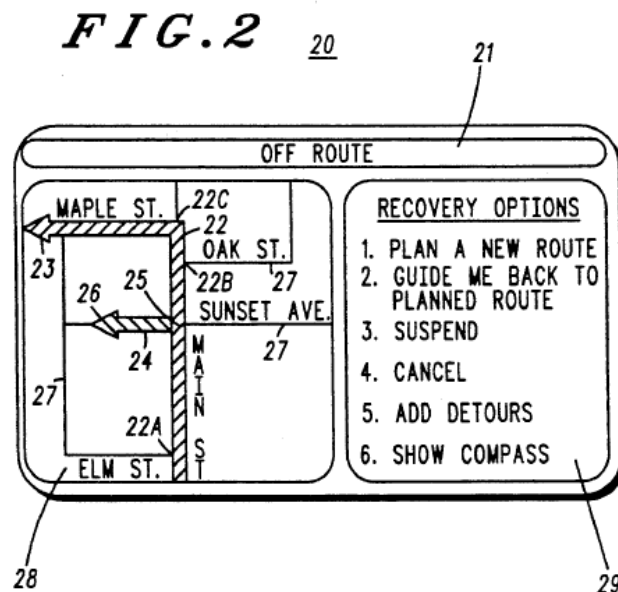
2. Overview Of U.S. Patent No. 5,243,528 (“Lefebvre”).

Lefebvre was issued on September 7, 1993, and is thus prior art to the ‘971 patent under pre-AIA §102(b). (EX1006 at [45].) Lefebvre was not cited during the prosecution of the ‘971 patent.

Lefebvre is directed to a land vehicle navigation apparatus 10 that includes a navigation computer 11. (*Id.* at 2:58-61.) Lefebvre’s navigation apparatus 10 includes means for detecting an off route condition in accordance with predetermined off route criteria. (*Id.* at 4:25-38, claims 6, 16, 23, 32, and 35.) “This ‘off route criteria’ can correspond to the estimated current vehicle position differing by more than a predetermined amount of distance from the desired navigation route.” (*Id.* at 4:25-38.) When Lefebvre’s navigation computer 11 detects an off route condition, an off route display 20 is produced on the color display 16. (*Id.* at 4:62-5:4.) The off route display 20 includes an “OFF ROUTE” text heading that identifies the display as an off route display and visually indicates to the driver that he or she is off route. (*Id.*) The off route display 20 may also include a visual indication of the desired direction of travel along the calculated navigation route and a visual indication of the actual vehicle travel route in a contrasting color. (*Id.* at 5:5-19.)

Lefebvre’s off route display 20 includes a recovery option table 29 that lists different recovery options, each of which represents a different manner of off route navigation recovery that can be selected by the driver through the input device 12.

(*Id.* at 5:45-54.) For example, the driver may select an option to guide the vehicle back to the current navigation route, or, in the case where the driver intentionally deviated from the navigation route, the driver may select options to suspend or cancel the route guidance. (*Id.* at 9:67-10:59.) An example of Lefebvre's off route display 20 is shown below:



(*Id.* at FIG. 2, 2:48-50.)

Lefebvre is analogous art to the '971 patent because Lefebvre is in the same field of endeavor as the '971 patent (*i.e.*, navigation devices that carry out route guidance) and is reasonably pertinent to a problem addressed by the '971 patent (*i.e.*, allowing the driver to decide how to respond to an off route condition). (EX1001 at 1:5-10, 1:48-62; EX1006 at 1:6-12, 2:26-40; EX1003, ¶87.)

3. Motivation To Combine Khavakh With Lefebvre.

Khavakh is directed to a navigation system 10 that is installed in a vehicle 11, such as a car or truck. (EX1005 at 3:36-38.) The navigation system 10 includes, among other things, a navigation software program 18 and a user interface 31 for allowing the driver to input information into the navigation system, such as a request for a route to a desired destination. (*Id.* at 3:47-53, 4:8-13.) The driver may also specify one or more intermediate waypoints for the route to pass through. (*Id.* at 9:39-47, 10:57-60, 12:12-18.) Khavakh's navigation program 18 includes a route guidance tool 91 for guiding the driver along a calculated route to the desired intermediate waypoints and destination. (*Id.* at claim 8, 5:25-32, 5:49-58, 7:16-22, 17:37-44.) Khavakh's user interface 31 also includes a display 27 for displaying a map and driving instructions to the driver. (*Id.* at 4:19-22, 29:64-30:7.)

Khavakh also teaches "an improved rerouting feature" that is activated when it is determined that "the vehicle in which the navigation system is installed departs from the originally calculated solution route as the vehicle is traveling." (*Id.* at 29:35-40, 29:54-62, 30:7-14, claim 9.) When the rerouting feature is activated, Khavakh's navigation system "prompts the end-user to indicate whether he or she wants a new route (*e.g.*, a re-route) to be calculated." (*Id.* at 30:17-20, claim 9.) Khavakh does not expressly specify the format or content of the driver prompt, or how the prompt is presented to the driver. (*Id.*; EX1003, ¶¶92-94.)

In the same field of endeavor, Lefebvre discloses a land vehicle navigation apparatus 10 that includes a navigation computer 11. (EX1006 at 2:58-61.) Lefebvre's navigation computer 11 computes a navigation route passing through one or more intermediate waypoints and a destination specified by the driver using an input device 12. (*Id.* at 2:65-3:1, 3:25-30, 6:27-37, 7:34-37.) "After computing a desired navigation route, the navigation computer 11 will then implement both audible and visual navigation guides to the vehicle operator to guide the vehicle to the destination along the calculated route." (*Id.* at 3:30-34.)

When Lefebvre's navigation computer 11 detects an off route condition (*i.e.*, that the vehicle has departed or deviated from the navigation route), an off route display 20 is produced on display 16. (*Id.* at 4:62-5:4, FIG. 2.) The off route display 20 includes an "OFF ROUTE" text heading that identifies the display as an off route display and visually indicates to the driver that he or she is off route. (*Id.*) The off route display 20 also includes a visual indication of the desired direction of travel along the calculated navigation route and a visual indication of the actual vehicle travel route in a contrasting color. (*Id.* at 5:5-19.)

The off route display 20 of Lefebvre also includes a recovery option table 29 that lists different recovery options, each of which represents a different manner of off route navigation recovery, that can be selected by the driver through the input device 12. (*Id.* at 5:45-54.) For example, the driver may select an option to guide

the driver back to the current navigation route, or, in the case where the driver intentionally deviated from the navigation route, the driver may select an option to suspend or cancel the route guidance. (*Id.* at 9:67-10:59; EX1003, ¶¶95-97.)

A POSITA would have been motivated to implement Khavakh's driver prompt in the form of Lefebvre's off route display 20 output on Khavakh's display 27. (EX1003, ¶¶98-106.)

Prior to the alleged invention of the '971 patent, one of the well-known problems in the field of vehicle navigation systems was "how to rapidly convey to the vehicle operator sufficient navigation information, and how this can be achieved without causing any excessive distraction of the vehicle operator while he is driving the vehicle." (EX1006 at 1:45-50.) As Lefebvre explains, some prior art navigation displays were undesirably complex and required a lengthy comprehension time for the vehicle driver, potentially causing the driver to be dangerously distracted. (*Id.* at 1:54-59.) On the other hand, some prior art navigation displays were overly simple (*e.g.*, just illustrating desired turns) and provided insufficient information to the driver, especially if the driver varied from the planned navigation route. (*Id.* at 1:59-63.)

According to Lefebvre, while it was often necessary and/or desirable to advise a driver that he or she had deviated from the navigation route, prior art systems that advised the driver that he or she is off route "typically [did] not taken into account

that sometimes the operator may require additional navigation instructions with regard to resuming his previous route and/or sometimes the vehicle operator may intentionally deviate from the previous route but wants to resumes the route with or without some modification at a later time.” (*Id.* at 1:64-2:5.) “In other words, prior systems [did] not sufficiently take[] into account the various reasons why an off course condition occurs, and therefore [did] not provide sufficient options to the driver with regard to recovering, in an efficient manner, from an off course condition.” (*Id.* at 2:5-10.)

Lefebvre also states that prior art systems “fail[ed] to visually indicate to the vehicle operator, in a short time comprehension format, his deviation from the previously calculated route..., [did] not provide the vehicle operator with a plurality of operator selectable recovery options, and [did] not advise the operator what recovery options are available.” (*Id.* at 3:56-66; *see also id.* at 2:10-12, 4:9-12.) “Typically, the only the options provided to the operator [were] either his resumption of the previous route within a specified amount of vehicle travel, or, if that does not occur, the automatic cancellation of the previous calculated route or the calculation of a new route.” (*Id.* at 3:66-4:3.) “This [did] not adequately take into account the desires of the vehicle operator which may be to be request guidance information from the navigation computer to guide him back to the previous route or to modify

the previous route or plan a new route from his current position rather than trying to resume the previous calculated route.” (*Id.* at 4:3-9.)

Lefebvre teaches that its off route display 20 solves the aforementioned problems by: (i) visually providing navigation information to the driver in a format that takes a minimal time to comprehend while still providing sufficient information to the user; (ii) allowing the driver to efficiently select how they want to respond to a detected off route condition; and (iii) providing the driver recovery flexibility by offering the driver a plurality of route recovery options. (*Id.* at 2:31-40, 4:13-24, 5:54-58, 8:15-30, 11:51-55; EX1003, ¶102.) Each of the benefits of Lefebvre’s off route display 20 advantageously increases driver safety, optimizes information exchange with the user, provides driver convenience, and enhances driver time management and system operational efficiency. (EX1003, ¶102.) A POSITA would have found each of the benefits of Lefebvre’s off route display 20 to be highly desirable and would have been motivated to implement Khavakh’s prompt in the form of Lefebvre’s off route display 20 to take advantage of each of these benefits. (*Id.*, ¶103.)

A POSITA also would have found it obvious to present Lefebvre’s off route display 20 on Khavakh’s display 27 because Lefebvre’s off route display 20 is a visual display that is intended to be visually presented to the driver on a display such as Khavakh’s display 27. (*Id.*, ¶104; EX1006 at 3:36-38, 4:62-64, FIGS. 1-2;

EX1005 at 4:19-22, 30:1-7.) A POSITA would have known that an audible off route alert, alone, would provide insufficient information to the driver to fully understand the nature of the deviation and what kind of correction would be needed (or desired), both of which are problems that Lefebvre’s off route display 20 solves. (EX1003, ¶104.) An off route display, as disclosed in Lefebvre, is able to provide significantly more information in an easier to comprehend format than an audible alert alone. (*Id.*)

A POSITA would also have been motivated to implement Khavakh’s prompt in the form of Lefebvre’s off route display 20 because it would have merely required applying Lefebvre’s known off route display technique to Khavakh’s system in the same way it functions in Lefebvre. (EX1003, ¶105.) “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007).

Here, the proposed combination would have involved the mere application of a known technique—displaying Lefebvre’s off route display 20 when the driver deviates from the calculated route—to a piece of prior art—Khavakh’s system that “prompts” the driver when he or she deviates from the originally calculated solution route—that is ready for the improvement. (EX1003, ¶105.) Khavakh’s system is nearly identical to, and functions in the same way as, Lefebvre’s system because

both systems provide an indication to the driver that he or she has deviated from a calculated route when a route deviation or off route condition is detected, and both systems provide the driver with at least one option for responding to the route deviation or off route condition. (*Id.*; EX1005 at 30:17-20, claim 9; EX1006 at 4:62-5:1, FIG. 2.) Lefebvre provides additional details regarding the format and content of the driver prompt that are missing from Khavakh. (EX1003, ¶105.)

A POSITA would also have had a reasonable expectation of success in implementing Khavakh's prompt in the form of Lefebvre's off route display 20. (EX1003, ¶106.) A POSITA would have known that implementing Khavakh's prompt in the form of Lefebvre's off route display 20 would have required routine, straightforward adjustments to the programming in Khavakh's navigation system. (*Id.*) A POSITA would also have recognized that Khavakh already discloses the hardware for implementing Lefebvre's off route display 20, including a memory, a processor, an input device, and a display. (*Id.*; EX1005 at 3:47-60, 4:19-21.) Additionally, as discussed above, Khavakh's and Lefebvre's systems operate in essentially the same way, with Lefebvre providing additional details regarding the format and content of a driver prompt that are missing from Khavakh. (EX1003, ¶106.)

A POSITA would also have been motivated to modify Khavakh in view of Lefebvre to output Lefebvre's off route display 20 when Khavakh's system

determines that the vehicle has deviated from the calculated route to a predetermined distance or more. (EX1003, ¶¶107-113.)

Prior art navigation systems, including both Khavakh's and Lefebvre's systems, typically used "map matching" to detect deviations from a calculated route. (*Id.*, ¶108; EX1005 at 29:57-30:14; EX1006 at 4:39-43, 7:42-53, 7:56-65.) "Map matching" worked by comparing the sensed vehicle location with road map data stored in memory. (*Id.*) If the sensed vehicle location did not correspond to a road segment which is part of the calculated route, or if the sensed vehicle heading did not correspond to the correct vehicle heading for proceeding along the calculated route, then an off route condition would be determined. (*Id.*)

To sense the vehicle's current location, both Khavakh's and Lefebvre's navigation systems include a positioning system that utilizes GPS and/or dead reckoning technology. (EX1005 at 3:61-64; EX1006 at 7:14-16.) Prior to the alleged invention of the '971 patent, however, it was well-known that GPS and dead reckoning-based navigation systems had inherent accuracy limitations. (EX1003, ¶109.) These inherent accuracy limitations would sometimes cause navigation systems to incorrectly show the driver's vehicle as traveling on an entirely different street. (*Id.*)

To account for the inherent accuracy limitations of GPS and dead reckoning technology, navigation systems such as Lefebvre's navigation apparatus 10 included

means for detecting an off route condition “in accordance with predetermined off route criteria.” (EX1003, ¶110; EX1006 at 4:25-38, claims 6, 16, 23, 32, and 35.)

This “off route criteria” corresponded to the estimated current vehicle position differing by a predetermined distance or more from the desired navigation route.

(*Id.*) By requiring the current vehicle position to differ by a predetermined distance or more from the desired navigation route before determining an off route condition, systems such as Lefebvre’s helped avoid the undesirable scenario where the navigation system erroneously alerts the driver of an off route condition. (EX1003, ¶110.) A POSITA would have found such a scenario to be highly undesirable because an erroneous off route message would unnecessarily distract, confuse, and frustrate the driver, and could even cause the driver to incorrectly deviate from a route that he or she was correctly following. (*Id.*)

Requiring the current vehicle position to differ by a predetermined distance or more from the desired navigation route before alerting the driver of an off route condition had an additional, well-known benefit. (EX1003, ¶111.) For example, in the case where the driver deviates from the calculated route by a short distance and realizes his or her mistake quickly, the driver could correct his or her course back onto the calculated route without being notified of an off route condition (assuming the deviation was less than the predetermined distance). (*Id.*) This desirably prevented the driver from being unnecessarily distracted with an off route message

when the driver was already aware that there had been a deviation from the calculated route. (*Id.*)

Accordingly, a POSITA would have been motivated to further modify Khavakh in view of Lefebvre to output Lefebvre's off route display 20 when Khavakh's system determines that the vehicle has deviated from the calculated route to a predetermined distance or more to desirably: (i) account for the inherent accuracy limitations of Khavakh's positioning system 24; (ii) help prevent erroneous off route messages and to avoid the distraction, confusion, and frustration that such erroneous off route messages create; and (iii) allow the driver to correct his or her course without being notified of an off route condition when the driver realizes the mistake quickly. (EX1003, ¶112.)

A POSITA would have had a reasonable expectation of success in further modifying Khavakh in view of Lefebvre to output Lefebvre's off route display 20 when Khavakh's system determines that the vehicle has deviated from the calculated route to a predetermined distance or more. (EX1003, ¶113.) A POSITA would have known the proposed modification would have required routine, straightforward adjustments to the programming in Khavakh's navigation system (*i.e.*, simply incorporating a predetermined distance into Khavakh's programming and logic for outputting an off route prompt). (*Id.*) Further, Khavakh's and Lefebvre's systems operate in essentially the same way, with both systems detecting off route conditions

or route deviations using a map matching technique. (*Id.*; EX1005 at 29:57-30:14; EX1006 at 4:39-43, 7:42-53, 7:56-65.)²

4. Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Independent Challenged Claims 1 And 19.

There are no material differences between independent Challenged Claims 1 and 19. (EX1008; EX1003, ¶115.) While the below analysis focuses on the limitations of Challenged Claim 19 (a method of using the navigation device of Challenged Claim 1), that analysis applies equally to the limitations of Challenged Claim 1 (a navigation device).

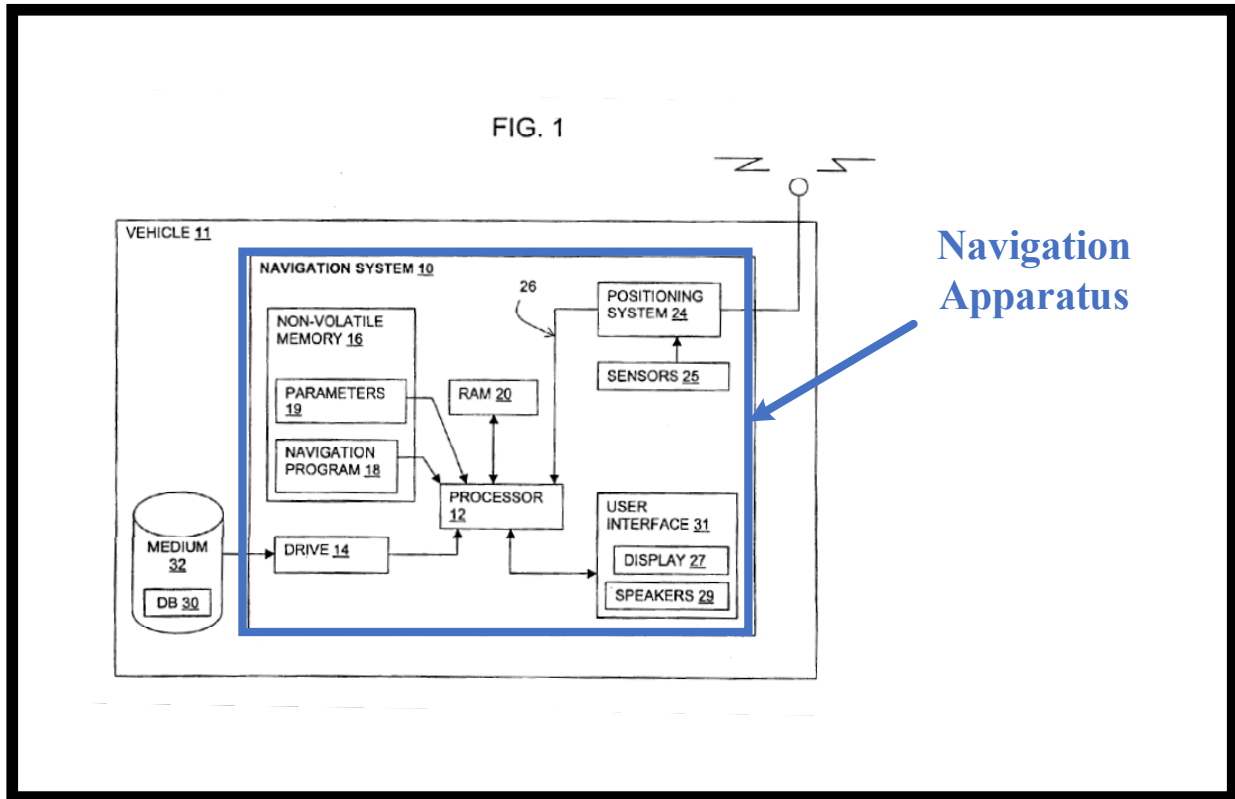
Accordingly, as demonstrated above and below, Khavakh in combination with Lefebvre and the knowledge of a POSITA renders obvious Challenged Claim 1 and Challenged Claim 19.

² The ‘971 patent provides no technical detail regarding outputting a message when it is determined that a vehicle has deviated from a route to a predetermined distance or more. (*See, e.g.*, EX1001 at 5:57-63, 8:60-9:6, 11:16-25, 11:33-42.) This further supports that the proposed modifications would have been conventional for a POSITA to implement. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).

(a) Khavakh Discloses “A navigation device” (“Limitation [1-PRE]”) And “A navigation method performed by utilizing a navigation apparatus” (“Limitation [19-PRE]”).

To the extent the preambles of the Challenged Claims are limiting, Khavakh discloses limitations [1-PRE] and [19-PRE].

Khavakh discloses a navigation system 10 that is installed in a vehicle 11, such as a car or truck. (EX1005 at 3:36-38.) Khavakh discloses that the navigation system 10 is a “combination of hardware and software components” that includes, among other things, a processor 12 and a navigation software program 18. (*Id.* at 3:47-53.) Khavakh’s navigation system 10 is an apparatus (or device), and thus a POSITA would have understood that it is a “navigation apparatus” (or “navigation device”). (EX1003, ¶¶118-120.) Khavakh’s navigation apparatus/device is shown below:



(EX1005 at FIG. 1 (annotated).)

Khavakh discloses a navigation method performed using the navigation system 10 (*i.e.*, navigation apparatus) that includes, among other things, calculating a solution route for the vehicle to travel and providing the user with guidance for following the solution route to a destination. (EX1003, ¶121; EX1005 at claim 1, claim 8, 1:17-18, 2:25-29, 5:35-43, 7:16-22, 17:37-44.) While Challenged Claim 1 recites a “navigation device” and Challenged Claim 19 recites a “navigation apparatus,” there are no differences between the claimed “navigation device” and “navigation apparatus.” (EX1001 at claims 1, 19; EX1003, ¶122.)

- (b) **Khavakh Discloses “a setting unit configured to set waypoints and a destination” (“Limitation [1a]”) And “setting, by utilizing a setting unit of the navigation apparatus, waypoints and a destination” (“Limitation [19a]”).**

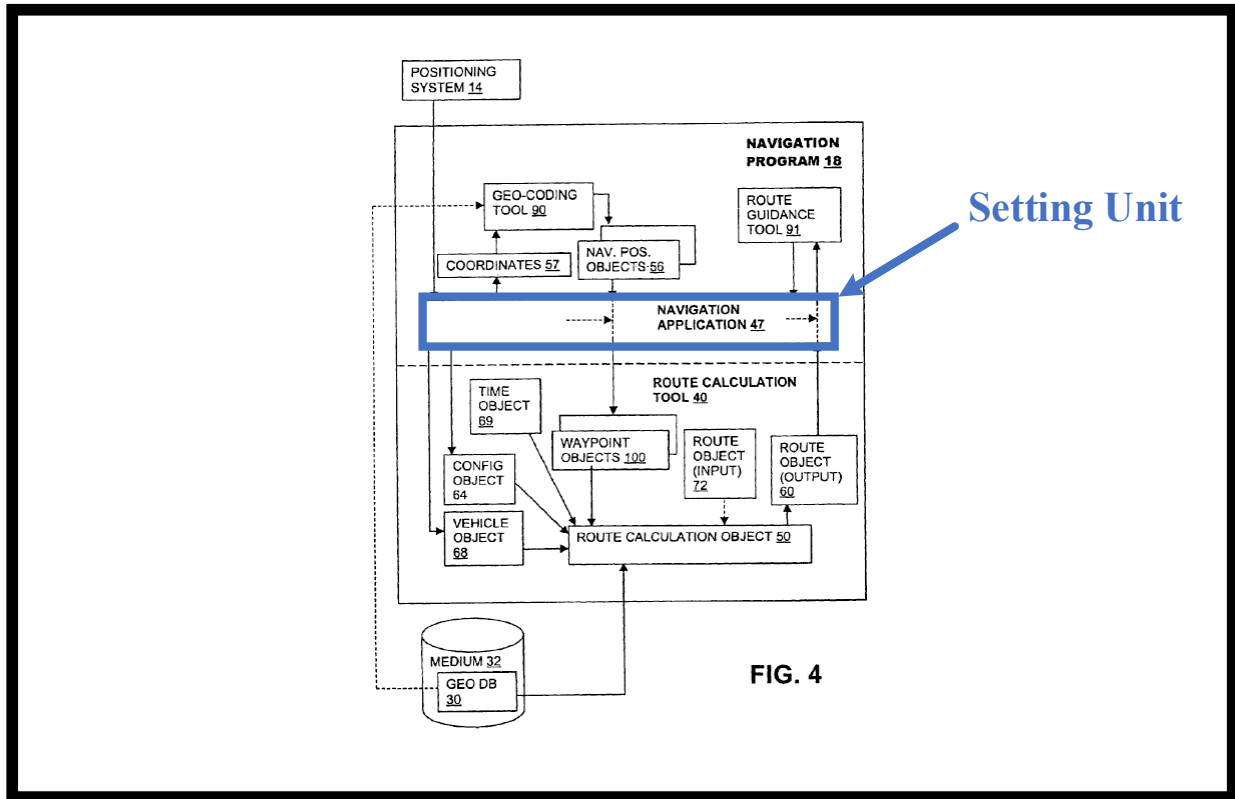
Khavakh discloses limitations [1a] and [19a].

Khavakh discloses that navigation program 18 (which is part of navigation apparatus 10), includes a navigation application 47 that creates waypoint objects 100. (EX1005 at 8:35-50.) “A waypoint object 100 is a data structure used to represent a waypoint,” such as a route origin and route destination, as well as one or more intermediate waypoints between the origin and destination. (*Id.* at 8:23-24, 8:27-34, 10:12-15, 12:12-18.) Khavakh’s navigation application 47 creates waypoint objects 100 using navigation position objects 56 that contain information about a location (*e.g.*, a street address, a point-of-interest, a crossroad, or some other location representing a desired destination or intermediate waypoint) derived from the user (*i.e.*, driver) via a user interface 31. (*Id.* at 8:52-65, 9:7-15, 9:39-58, 10:27-30.)

After navigation application 47 creates waypoint objects 100 for the destination and any desired intermediate waypoints, navigation application 47 provides the waypoint objects 100 to route calculation tool 40. (*Id.* at 8:21-26, 8:36-38, 9:35-38, 9:53-58, 10:8-10, 10:27-30.) Using the provided waypoint objects 100, route calculation tool 40 calculates a route that must pass through the waypoint

objects 100 representing the destination and intermediate waypoints. (*Id.* at 6:15-18, 8:21-34, 9:53-58, 10:8-15.) A POSITA would have understood that Khavakh’s navigation application 47 is a “setting unit” of navigation system 10 (*i.e.*, the navigation apparatus) because navigation application 47 sets, using waypoint objects 100, intermediate waypoints and a destination through which the calculated route must pass. (EX1003, ¶¶124-129.)³ Khavakh’s setting unit is shown below:

³ The ‘971 patent states that the claimed “setting unit,” “route searching unit,” and “route guidance unit” may be components of a control unit 10 (*e.g.*, a microcomputer) and “can be comprised of an application program that operates under the control of the microcomputer.” (EX1001 at 4:37-46.) Khavakh’s “setting unit,” “route searching unit,” and “route guidance unit” are similarly components of a navigation software program 18 that runs on a processor 12. (EX1005 at 3:47-60, 4:4-5, FIG. 1, FIG. 4; EX1003, ¶131.)



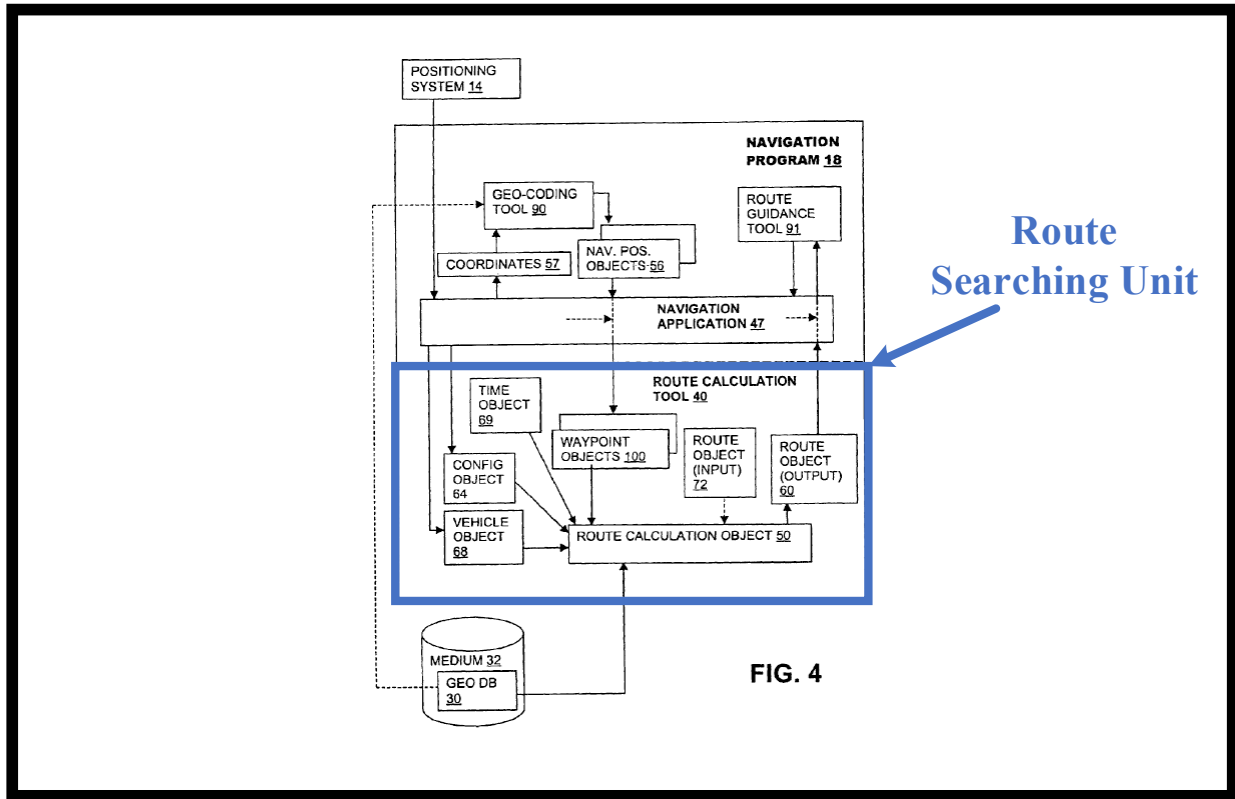
(EX1005 at FIG. 4 (annotated).)

Khavakh further discloses the step of setting, using navigation application 47 (*i.e.*, the setting unit), intermediate waypoints and a destination. (EX1003, ¶130; EX1005 at 9:53-58, 10:8-15, 10:27-30, 12:12-18, 13:56-61, 32:35-54.) In one example, Khavakh teaches setting a destination and an intermediate waypoint representing a restaurant. (EX1005 at 10:57-60.)

- (c) **Khavakh Discloses “a route searching unit configured to search for a whole route leading to the destination via the waypoints set by said setting unit” (“Limitation [1b]”) And “searching, by utilizing a route searching unit of the navigation apparatus, for a whole route leading to the destination via the waypoints set by said setting step” (“Limitation [19b]”).**

Khavakh discloses limitations [1b] and [19b].

Khavakh discloses that navigation program 18 (which is part of navigation apparatus 10), includes a route calculation tool 40 configured to determine routes between specified locations for the vehicle to travel on (*i.e.*, to perform route searching). (EX1005 at 5:35-43; *id.* at claim 1, 1:17-18, 2:25-29.) Khavakh’s route calculation tool 40 may be implemented as a separate application (or subprogram) of navigation program 18 or may be compiled into an executable module. (*Id.* at 5:25-32, 5:59-64.) A POSITA would have understood that Khavakh’s route calculation tool 40 is a “route searching unit” of navigation system 10 (*i.e.*, the navigation apparatus) because route calculation tool 40 is configured to perform route searching. (EX1003, ¶¶134-136.) Khavakh’s route searching unit is shown below:



(EX1005 at FIG. 4 (annotated).)

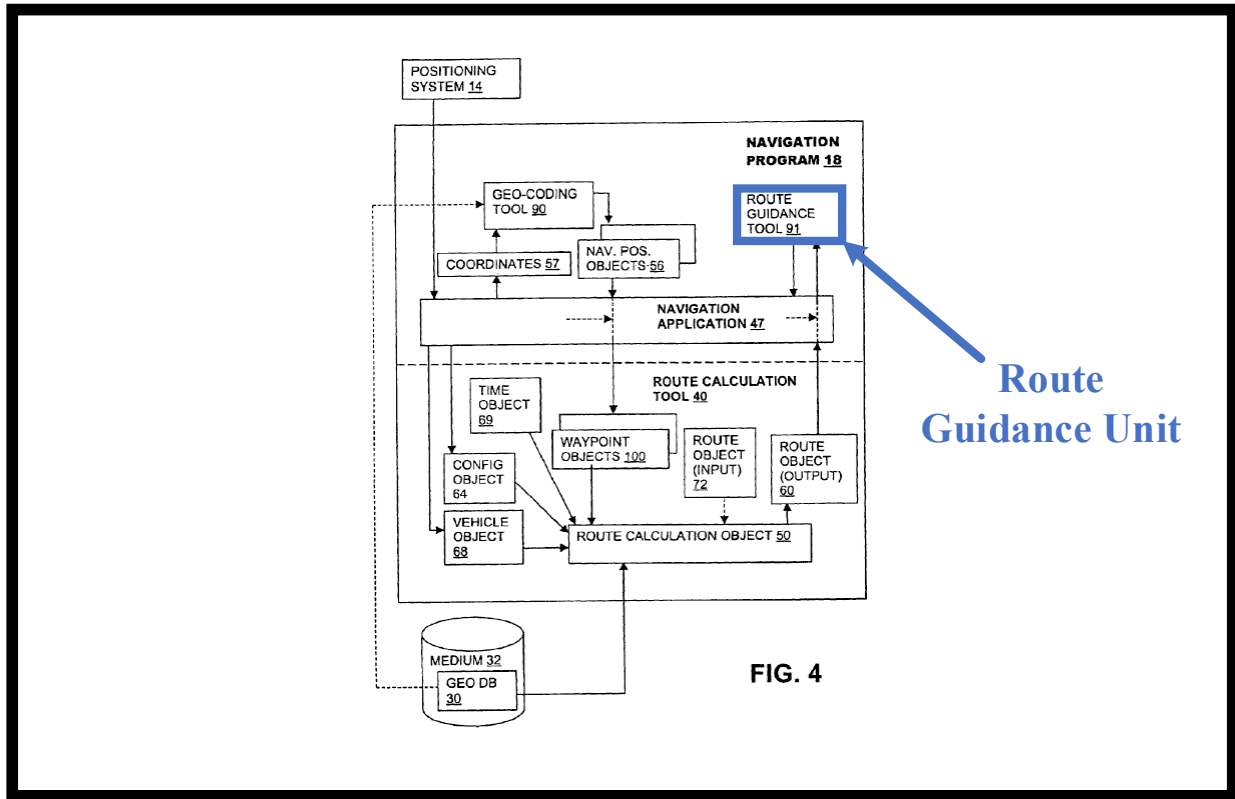
Khavakh also discloses the step of searching, using route calculation tool 40, for a whole route leading to a destination via waypoints set by navigation application 47 (*i.e.*, the setting unit) in the setting step. (EX1003, ¶¶137-140.) Khavakh's navigation application 47 sets a destination and intermediate waypoints using waypoint objects 100 and provides the waypoint objects 100 to route calculation tool 40. (EX1005 at 8:21-34, 8:36-38, 9:35-38, 9:53-58, 10:8-15, 10:27-30, 12:12-18.) Using the provided waypoint objects 100, route calculation tool 40 searches for an “entire route” (*i.e.*, a whole route) leading to the set destination. (*Id.* at 22:66-23:3, 23:7-9, 32:35-54; *see also id.* at 6:15-18, 7:2-16, 8:27-34, 12:12-18, 22:49-66.)

Khavakh discloses that the calculated whole route must pass via the intermediate waypoints set by navigation application 47 in the setting step. (*Id.* at 8:21-26, 10:8-15; *see also id.* at 13:56-61, 32:35-54.)

- (d) **Khavakh Discloses “a route guidance unit configured to carry out route guidance according to the whole route which is searched for by said route searching unit” (“Limitation [1c]”) And “carrying out, by utilizing a route guidance unit of the navigation apparatus, route guidance according to the whole route which is searched for by said route searching step” (“Limitation [19c]”).**

Khavakh discloses limitations [1c] and [19c].

Khavakh discloses that navigation program 18 (which is part of navigation system 10 (*i.e.*, the navigation apparatus)), includes a route guidance tool 91, which is a tool program configured to perform route guidance. (EX1005 at 5:49-58; *id.* at claim 8, 5:25-32, 7:16-22, 17:37-44.) A POSITA would have understood that Khavakh’s route guidance tool 91 is a “route guidance unit” of navigation system 10 (*i.e.*, the navigation apparatus) because route guidance tool 91 is configured to provide route guidance. (EX1003, ¶¶143-144.) Khavakh’s route guidance unit is shown below:



(EX1005 at FIG. 4 (annotated).)⁴

Khavakh also discloses the step of carrying out, using a route guidance unit (e.g., route guidance tool 91), route guidance according to the whole route searched for by route calculation tool 40 (i.e., the route searching unit) in the route searching

⁴ In an alternative embodiment, Khavakh discloses that a program in navigation application 47 may provide the route guidance functionality. (EX1005 at 5:49-58.) A POSITA would have also understood this route guidance program to be a “route guidance unit” because it is a program that performs route guidance. (EX1003, ¶145.)

step. (EX1003, ¶¶146-149.) After Khavakh's route calculation tool 40 calculates a whole route, route calculation tool 40 stores the calculated whole route in an output route object 60 that is provided to navigation application 47. (EX1005 at 17:37-44, 22:49-54, 29:41-43; *id.* at 22:55-23:3, 32:35-54.)⁵ The route guidance tool 91 (or, alternatively, the route guidance program in navigation application 47) then carries out route guidance (*e.g.*, provides driving instructions) according to the whole route stored in output route object 60. (*Id.* at 7:16-22, 17:37-44; *see also id.* at claim 8, 5:25-32, 5:49-58, 29:64-30:7.)

⁵ Navigation application 47 may in turn provide output route object 60 to route guidance tool 91. (*Id.* at 5:49-58, 17:37-44.)

- (e) **Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Teaches And Renders Obvious “an output unit configured to output a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when said route guidance unit determines that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint” (“Limitation [1d]”) And “outputting, by utilizing an output unit of the navigation apparatus, a message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading when, by said route guidance step, it is determined that the vehicle has deviated from the route to a predetermined distance or more and is traveling along a route after said first next waypoint” (“Limitation [19d]”).**

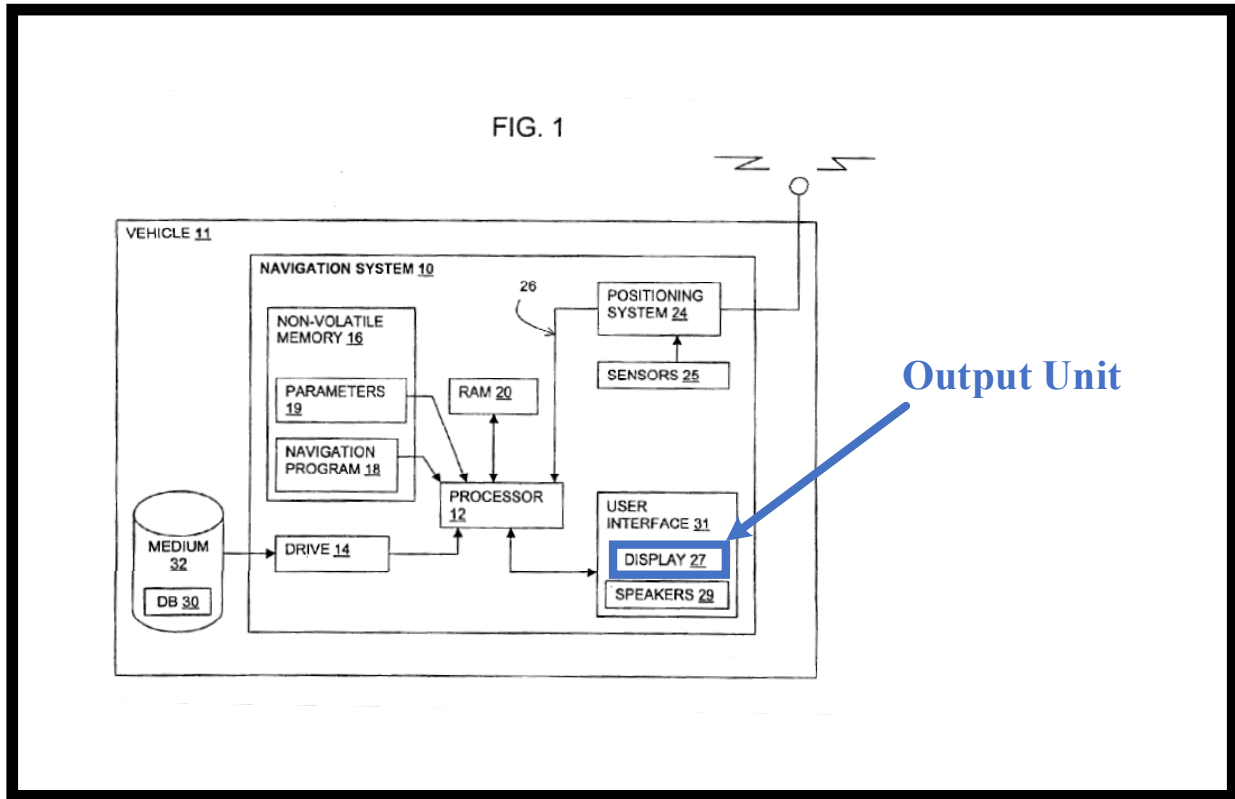
Khavakh in combination with Lefebvre and the knowledge of a POSITA teaches and renders obvious limitations [1d] and [19d]. (EX1003, ¶¶151-181.)

Khavakh discloses that navigation system 10 (*i.e.*, the navigation apparatus) has a user interface 31 that includes equipment that provides information back to the end-user, such as display 27. (EX1005 at 4:19-22.) A POSITA would have understood that Khavakh’s display 27 is an “output unit” of navigation system 10

because display 27 is configured to output information to the driver. (EX1003, ¶¶152-153; EX1005 at 4:19-22.)^{6, 7} Khavakh’s output unit is shown below:

⁶ The ‘971 patent supports that the claimed “output unit” may include a “display.” (EX1001 at claim 8.) Patent Owner has likewise confirmed in related district court proceedings that the claimed “output unit” may be a display. (EX1009 at 22; EX1010 at 13.)

⁷ A POSITA would have understood that the software and/or hardware (*e.g.*, a graphics card) that produces the images displayed on Khavakh’s display 27 may also be considered part of Khavakh’s “output unit.” (EX1003, ¶155; EX1005 at 5:25-32, 5:49-58.)



(EX1005 at FIG. 1 (annotated).)

Khavakh in combination with the knowledge of a POSITA further teaches and renders obvious outputting, using display 27 (*i.e.*, the “output unit”) of navigation system 10, a prompt to the driver to indicate whether he or she wants a new route to be calculated when, by the route guidance step, it is determined that the vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading and is traveling along a route after said first next waypoint. (EX1003, ¶¶156-172.)

Khavakh teaches “an improved rerouting feature” that is activated when it is determined that “the vehicle in which the navigation system is installed departs from

the originally calculated solution route as the vehicle is traveling,” such as when “the vehicle position corresponds to a segment record that is not among the records in the solution route (or if the direction of travel is incorrect).” (EX1005 at 29:35-40, 29:54-62, 30:7-14, claim 9.) When the rerouting feature is activated, Khavakh’s navigation system “prompts the end-user to indicate whether he or she wants a new route (*e.g.*, a re-route) to be calculated.” (*Id.* at 30:17-20, claim 9.) Khavakh at least suggests prompting the driver using Khavakh’s display 27 (*i.e.*, the “output unit”) because display 27 is used to provide information (*e.g.*, route guidance information) back to the driver (EX1005 at 1:36-40, 4:19-22, 7:16-22, 30:4-7), and a POSITA would have understood that Khavakh’s prompt is consistent with the type of route guidance information that is output using Khavakh’s display 27. (EX1003, ¶159.)

Khavakh also teaches that its prompt is output when it is determined that the vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading. (EX1003, ¶¶160-163.) According to Khavakh, the prompt is output when the vehicle “departs from the originally calculated solution route.” (EX1005 at 29:35-40, 29:54-62, 30:7-14, claim 9.)⁸ Khavakh teaches that a

⁸ Khavakh teaches that a route deviation is detected when, for example, it is determined that the vehicle is on a road that is not part of the solution route or is

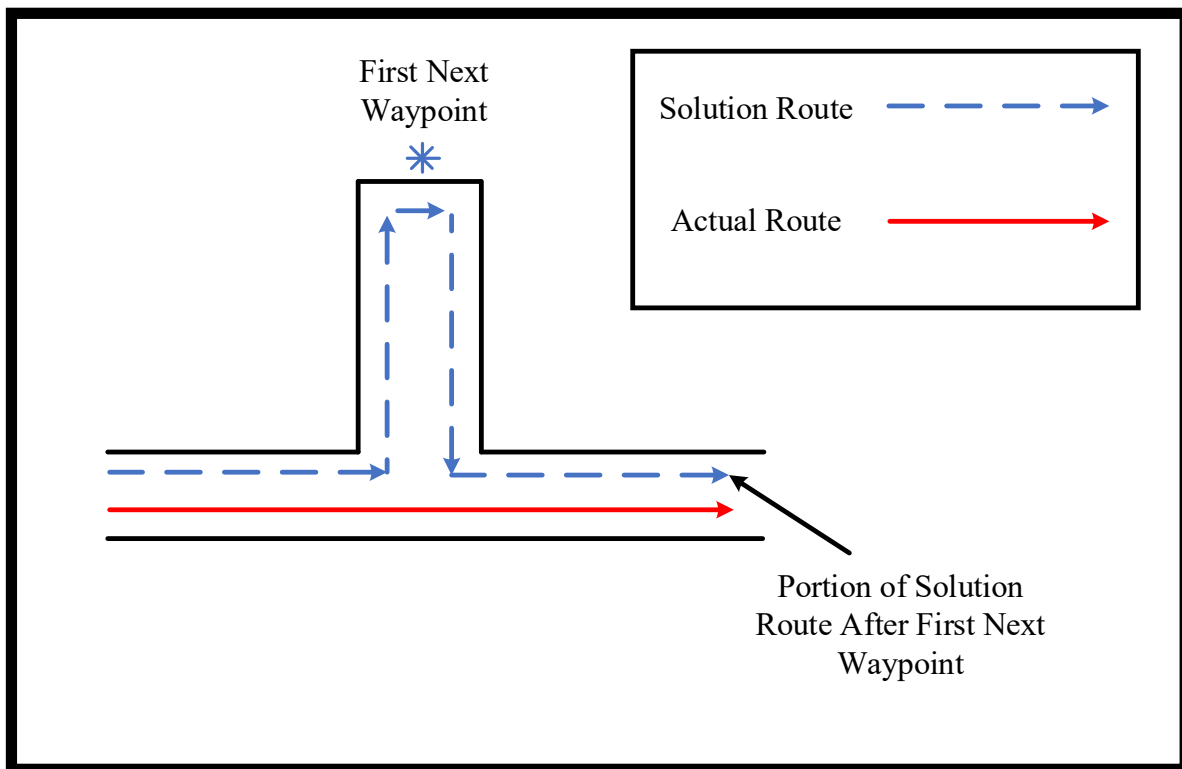
calculated solution route is a “single route” that must pass through each of the intermediate waypoints in order. (*Id.* at 7:4-6, 8:21-26, 10:8-15, 13:56-61, 22:55-23:3, 32:35-54.) When a vehicle implementing Khavakh’s system and method departs from the solution route leading to an upcoming waypoint (*i.e.*, a first next waypoint) by, for example, failing to make a required turn toward the waypoint, a deviation is detected and Khavakh prompts the driver because the vehicle is no longer following the originally calculated solution route. (EX1003, ¶163; EX1005 at 29:35-40, 29:54-62, 30:7-14, claim 9.)⁹

Khavakh’s prompt would also be output when it is determined that the vehicle has deviated from the route leading to the first next waypoint toward which the vehicle has been heading and is traveling along a route after said first next waypoint. (EX1003, ¶164.) In the below illustrated example, the driver was supposed to make a left turn to travel towards the first next waypoint, but instead continued straight and bypassed the first next waypoint. (*Id.*, ¶165.) The driver, by continuing straight,

traveling in the wrong direction for proceeding along the solution route. (*Id.* at 29:54-62, 30:7-14.)

⁹ For example, the vehicle would no longer be traveling on a road that is part of the solution route and/or would be traveling in the wrong direction (*e.g.*, vehicle traveling east when it was supposed to turn north). (EX1003, ¶163.)

is traveling along a portion of the solution route after said first next waypoint. In this scenario, Khavakh teaches that a prompt is output because the vehicle has deviated from the originally calculated solution route (*i.e.*, the driver did not make the required left turn toward the first next waypoint and did not pass through the intermediate waypoint that the solution route must pass through). (*Id.*; EX1005 at 29:35-40, 29:54-62, 30:7-14, claim 9; *see also id.* at 8:21-26, 10:8-15.)



(EX1003, ¶165.)

It would have been obvious to use Khavakh's navigation system 10 in such a scenario. (EX1003, ¶166.) Prior to the alleged invention of the '971 patent, it was commonplace and desirable to use a navigation system to set a route that would require the driver to briefly depart from, and then return to, a main roadway to reach

an intermediate waypoint. (*Id.*, ¶167.) For example, it was typical to set an intermediate waypoint down a cul-de-sac (*e.g.*, for briefly stopping at an acquaintance's house), off a highway exit (*e.g.*, for stopping for gas or food on a road trip), or in a parking lot (*e.g.*, for running an errand). (*Id.*) It was also routine for drivers to (accidentally or intentionally) bypass such an intermediate waypoint by failing to make a required turn toward the waypoint (*e.g.*, accidentally missing a highway exit, intentionally skipping a rest stop in favor of one further down the road, etc.). (*Id.*) Thus, it would have been obvious to use Khavakh's navigation system 10 in a scenario where the driver deviates from a route leading to a first next waypoint toward which the vehicle has been heading and is traveling along a route after the first next waypoint. (*Id.*)

Khavakh also teaches that the determination that the vehicle has deviated from the solution route is made by the route guidance step. (EX1003, ¶168.) Khavakh's route guidance step provides route guidance (*e.g.*, driving instructions) to the driver according to the solution route stored in output route object 60. (EX1005 at 7:16-22, 17:37-44.) Khavakh further teaches that determining whether the vehicle has deviated from the solution route is part of the route guidance process. (*Id.* at 29:35-40, 29:54-62, 30:7-14, claim 9.) A POSITA would have understood that Khavakh's route guidance step determines that a vehicle has deviated from a solution route. (EX1003, ¶168.)

To the extent the Challenged Claims of the ‘971 patent require the route guidance unit in particular to determine that the vehicle has deviated from the solution route, Khavakh also suggests and renders obvious this requirement. (EX1003, ¶¶169-171.) Khavakh teaches determining that the vehicle has deviated from the solution route using “a map matching program” that compares the vehicle’s current position to the road segments records for the solution route. (EX1005 at 29:57-64; *id.* at 29:65-30:10.) Besides detecting route deviations, the map matching program allows the driver to see driving instructions in advance of a maneuver and to see his or her current position on the display. (*Id.* at 30:1-7.) Map matching programs like Khavakh’s were well-known in the art and were commonly used in route guidance programs and applications to enable desirable route guidance features such as notifying drivers of upcoming maneuvers and detecting route deviations. (EX1003, ¶171; EX1006 at 4:39-40 (“Many prior navigation systems use a map matching technique...”); *id.* at 7:9-14, 7:42-65.)

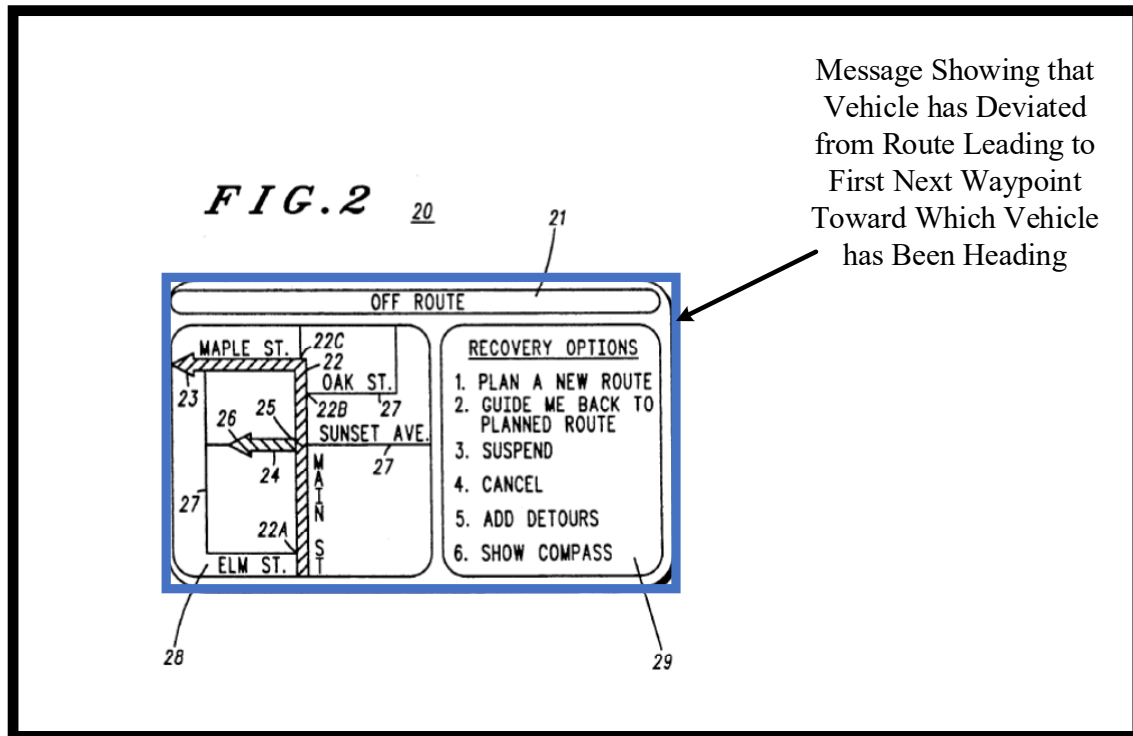
Consistent with this knowledge, a POSITA would have found it obvious to implement Khavakh’s map matching program that determines that the vehicle has deviated from the solution route as part of Khavakh’s route guidance unit to enable desirable route guidance features such as notifying drivers of upcoming maneuvers and detecting route deviations. (EX1003, ¶171.) Doing so would have been a simple matter of design choice that would have been trivial to a POSITA to implement.

(*Id.*) Indeed, Khavakh discloses that its map matching program is part of the navigation program 18 and leaves it up to a POSITA to decide where specifically in the navigation program 18 to put it. (*Id.*; EX1005 at 29:57-64.)

Accordingly, Khavakh in combination with the knowledge of a POSITA renders obvious outputting, using display 27, a prompt when, by the route guidance step, it is determined that the vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading and is traveling along a route after said first next waypoint. (EX1003, ¶172.)

As further demonstrated in Section IV(A)(3), *supra*, a POSITA would have been motivated to modify Khavakh in view of Lefebvre to output, using Khavakh's display 27, a prompt in the form of Lefebvre's off route display 20 when, by the route guidance step, it is determined that the vehicle has deviated from the route leading to a first next waypoint toward which the vehicle has been heading to a predetermined distance or more and is traveling along a route after said first next waypoint. (EX1003, ¶173.)

As demonstrated below, Lefebvre's off route display 20 teaches the claimed "message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading." (EX1003, ¶¶174-180.)



(EX1006 at FIG. 2 (annotated).)

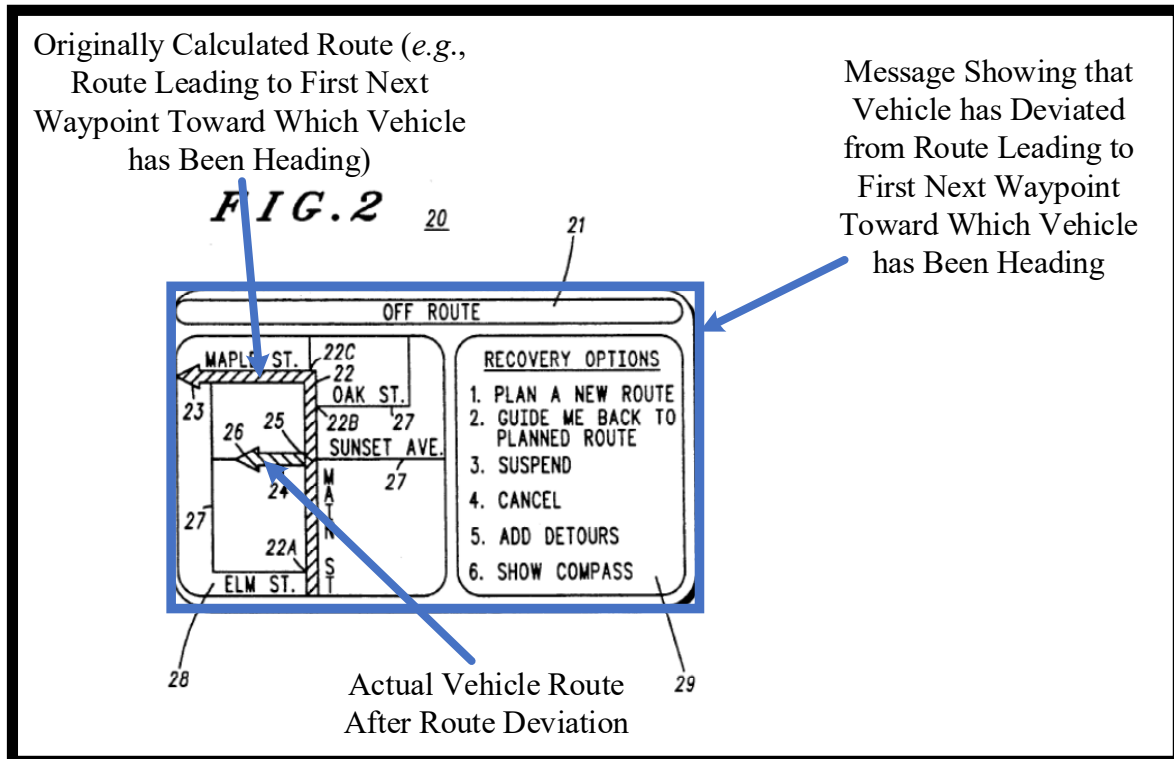
Lefebvre teaches an off route display 20 that is produced on a display 16 when a navigation computer 11 detects a deviation from a calculated route. (EX1006 at 4:62-64, 7:38-42, 8:3-5.) The off route display 20 includes “an ‘OFF ROUTE’ text heading 21 which identifies the display as an off route display” and “visually indicates to the operator that he is off route.” (*Id.* at 4:64-5:1, FIG. 2.) The off route display 20 also includes a map portion 28 that (i) visually indicates “the desired direction of travel along the calculated navigation route”; and (ii) visually indicates, in a contrasting color, the vehicle’s actual travel route “from at least an initially calculated point 25 at which the vehicle deviated from the calculated route to the estimated current vehicle position.” (*Id.* at 5:5-19, 8:5-14.)

A POSITA would have understood that Lefebvre’s off route display 20 is a “message showing that a vehicle has deviated from a route leading to a first next waypoint toward which the vehicle has been heading.” (EX1003, ¶¶178-180.)^{10, 11} As Lefebvre explains, the off route display 20 is displayed when the driver deviates from the calculated route and “visually indicates to the operator that he is off route” (e.g., has deviated from the route leading to the first next waypoint toward which the vehicle has been heading) using an “OFF ROUTE” text heading 21 and a map portion 28. (EX1006 at 4:62-5:1, 7:38-53, 8:3-5.) The map portion 28 of off route display 20 further shows that the vehicle has deviated from the route leading to the

¹⁰ The specification of the ‘971 patent does not disclose any particular requirements for the contents of the claimed “message.” (EX1001 at 1:66-2:26.) Instead, the ‘971 patent merely discloses an example “message” in the form of a display that states: “You Have Deviated from the Route. Will You Pass via the Waypoint?” (*Id.* at FIG. 7, 2:51-54, 8:60-9:6.) The claimed “message” is not limited to the embodiment shown in FIG. 7. (EX1011 at 15-16.)

¹¹ In related district court proceedings involving the ‘971 patent, Patent Owner has asserted that (i) a pop-up message that simply says “Re-calculating” (EX1011 at 14-15) and (ii) an icon that simply says “Drive to” (EX1010 at 13, 17) are sufficient to meet the claimed “message.”

first next waypoint toward which the vehicle has been heading by (i) showing the calculated navigation route leading to the first next waypoint in one color; and (ii) showing the vehicle's actual route from the route deviation point in a contrasting color. (*Id.* at 5:5-19, 8:5-14.)



(EX1006 at FIG. 2 (annotated).)

- (f) **Khavakh In Combination With Lefebvre Teaches And Renders Obvious “an input unit configured to input a command indicating whether or not to travel via said first next waypoint in response to the message outputted by said output unit” (“Limitation [1e]”) And “inputting, by utilizing an input unit of the navigation apparatus, a command indicating whether or not to travel via said first next waypoint in response to the outputted message” (“Limitation [19e]”).**

Khavakh in combination with Lefebvre teaches and renders obvious limitations [1e] and [19e]. (EX1003, ¶¶182-195.)

Khavakh discloses that navigation system 10 (*i.e.*, the navigation apparatus) has a user interface 31 that “includes appropriate equipment that allows the end-user to input information into the navigation system.” (EX1005 at 4:7-10.) “The equipment used to input information into the navigation system may include a keypad, a keyboard, a microphone, etc., as well as appropriate software, such as a voice recognition program.” (*Id.* at 4:16-19.) A POSITA would have understood that Khavakh’s keypad, keyboard, or microphone, together with the “appropriate software” associated therewith, is an “input unit” of navigation system 10 because they function to input driver commands (*e.g.*, “a request for a route to a desired

destination”) into Khavakh’s navigation system 10. (EX1003, ¶¶183-184; EX1005 at 4:7-19.)¹²

As further demonstrated in Section IV(A)(3), *supra*, a POSITA would have been motivated to combine Khavakh with Lefebvre’s off route display 20. (EX1003, ¶185.) The combination of Khavakh with Lefebvre’s off route display 20 teaches inputting, by utilizing an input unit of the navigation apparatus, a command indicating whether or not to travel via said first next waypoint in response to the outputted message. (*Id.*, ¶¶186-194.)¹³

Lefebvre’s off route display 20 “includes a recovery option table portion 29” that “comprises a table listing of six different recovery option legends numbered 1

¹² Patent Owner has asserted in related district court proceedings that the claimed “input unit” may be a “button.” (EX1009 at 26; EX1010 at 17.)

¹³ The use of the term “command” (singular) and the use of a disjunctive “or” between “whether or not” in limitation [19e] means that Challenged Claim 19 requires the input of only one of the two types of claimed “command” to satisfy the claim (*e.g.*, a command indicating to travel via the first next waypoint **or** a command indicating not to travel via the first next waypoint). *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1199 (Fed. Cir. 2013). Nevertheless, the combination of Khavakh with Lefebvre teaches inputting **both** types of claimed “command.”

through 6.” (EX1006 at 5:46-49.) “Each of these legends represents a different recovery option which can be selected by the vehicle operator by means of [an] input device 12,” and “[e]ach option represents a different manner of off route navigation recovery which is [] selectable by the vehicle operator.” (*Id.* at 5:49-54.) The recovery option table portion 29 allows the driver to “select the recovery option which best suits his needs” in response to the output of Lefebvre’s display 20 (*i.e.*, the claimed “message”). (*Id.* at 8:31-38.)

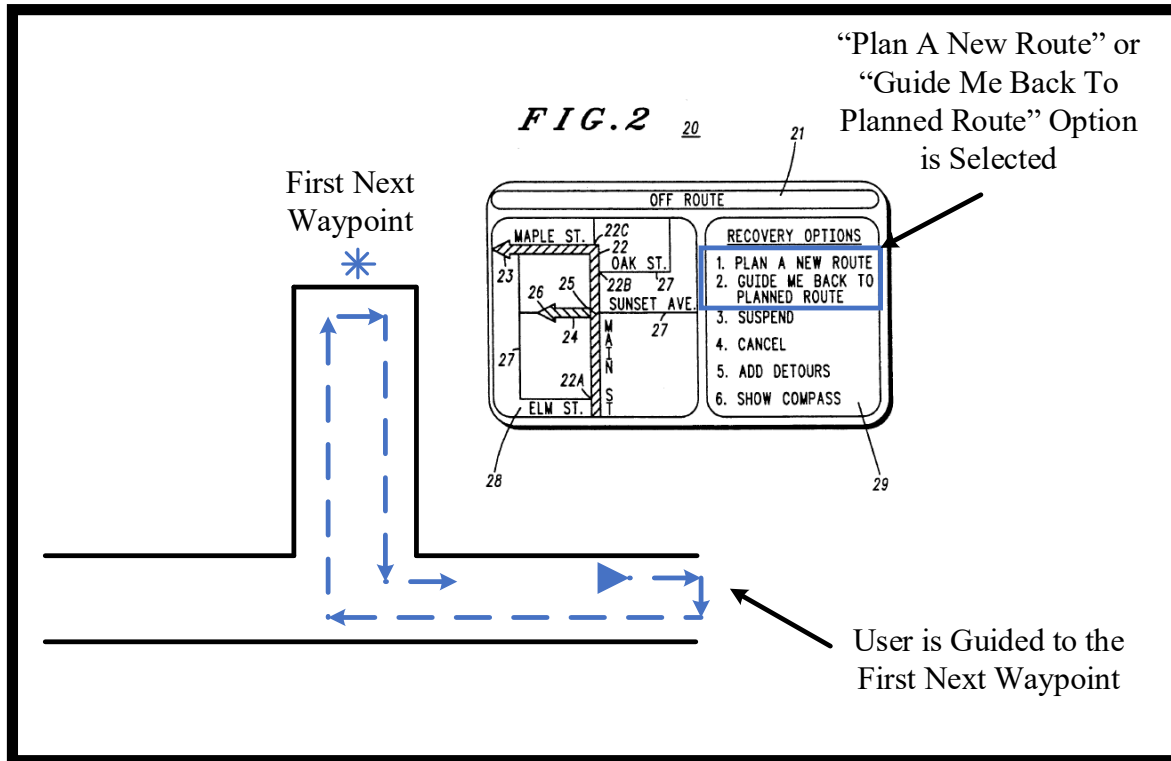
One of the recovery options in Lefebvre’s recovery option table portion 29 is an option to “guide me back to planned route.” (*Id.* at FIG. 2, 9:67-10:4.) Lefebvre teaches that when this option is selected, a start point is set at the vehicle’s current location, a first destination point is set “at the point 25 at which actual vehicle travel deviated from the current navigation route,” and the next destination points for the trip are set to the “previous trip destinations which were not yet reached during previous vehicle travel.” (*Id.* at 10:4-11.) A route is then calculated “which includes getting back to the deviation point 25 and then, using the same trip preferences and detours previously specified, reaching the end destinations that were previously specified.” (*Id.* at 10:12-16.) According to Lefebvre, the “guide me back to planned route” option is desirable when the driver “merely [wants to] get back to [the] original route and receive guidance instructions on how to do that.” (*Id.* at 10:16-20.)

Like the “guide me back to planned route” option, Lefebvre also teaches that recovery option table portion 29 includes an option to “plan a new route.” (*Id.* at FIG. 2, 9:44-66.) When the “plan a new route” option is selected, a start point is set at the vehicle’s current location and a new route is calculated to the previously specified destination(s) subject to the originally specified route preferences. (*Id.* at 9:44-66.)

Accordingly, the combination of Khavakh with Lefebvre teaches inputting, using Khavakh’s keypad, keyboard, or microphone (*i.e.*, the input unit), a command to execute the “plan a new route” option or the “guide me back to planned route” option in response to the output of Lefebvre’s off route display 20 (*i.e.*, the claimed “message”). (EX1003, ¶190; EX1006 at 9:30-42; EX1005 at 3:47-60.)

Inputting the command to execute the “plan a new route” option or the “guide me back to planned route” option discloses inputting a command indicating to travel via said first next waypoint because the command to execute either of these options causes the driver to be guided to the bypassed first next waypoint by either (i) calculating a new route to the previously specified destination via the previously specified intermediate waypoints, including the first next waypoint (the “plan a new route” option); or (ii) calculating a route that returns to driver to the route deviation point and then resumes the originally calculated route, which passes through the first next waypoint (the “guide me back to planned route” option). (EX1003, ¶191;

EX1006 at 9:44-10:22; EX1005 at 7:4-6, 8:21-26, 10:8-15, 13:56-61, 22:55-23:3, 32:35-54.)



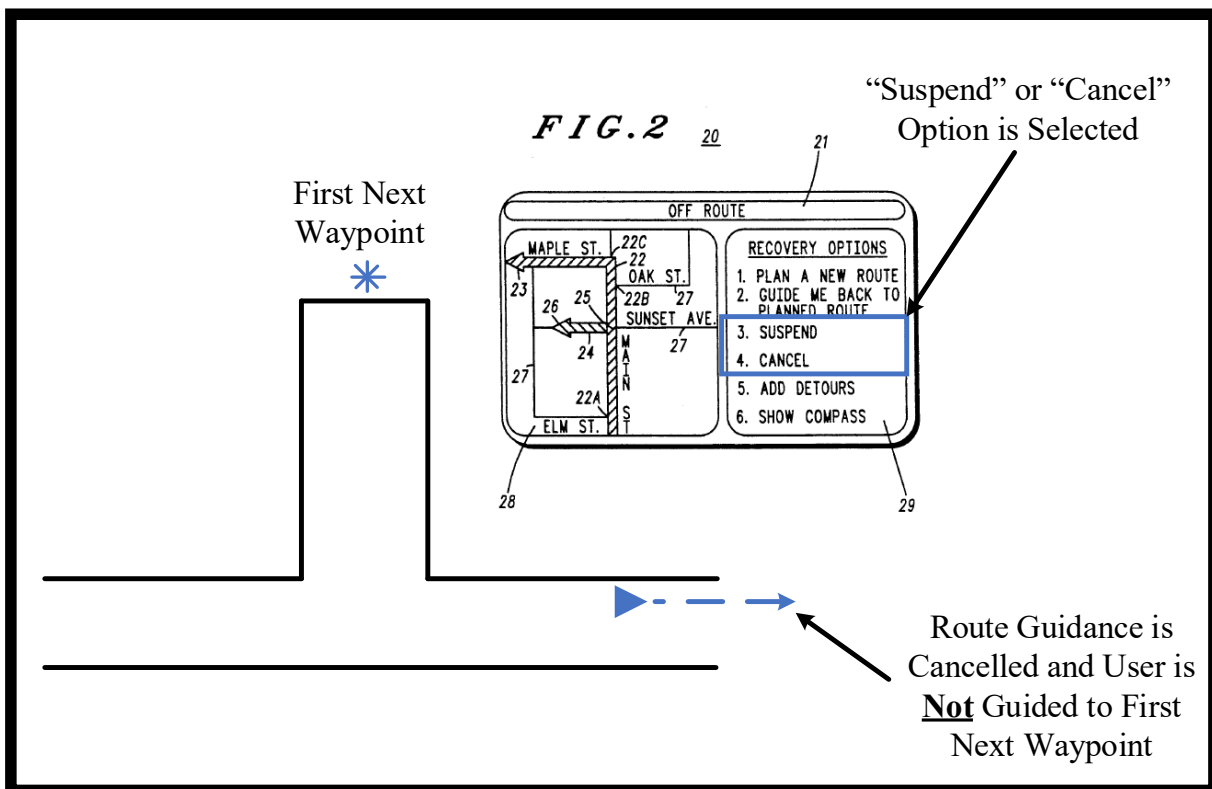
(EX1006 at FIG. 2 (annotated).)

Lefebvre further teaches that two additional recovery options in recovery option table portion 29 are options to “suspend” or “cancel” the route guidance. (EX1006 at FIG. 2, 10:23-59.) When the driver selects the “suspend” or “cancel” options, route guidance is cancelled and the off route display 20 is removed. (*Id.*) According to Lefebvre, the “suspend” and “cancel” options are useful when the driver has intentionally deviated from the originally calculated route. (*Id.*)

Accordingly, the combination of Khavakh with Lefebvre also teaches inputting, using Khavakh’s keypad, keyboard, or microphone (*i.e.*, the input unit), a

command to execute the “suspend” option or the “cancel” option in response to the output of Lefebvre’s off route display 20 (*i.e.*, the claimed “message”). (EX1003, ¶193; EX1006 at 9:30-42; EX1005 at 3:47-60.)

Inputting the command to execute the “suspend” option or the “cancel” option discloses inputting a command indicating not to travel via said first next waypoint because the command to execute either of these options causes route guidance to be cancelled (*i.e.*, the driver is not guided to the first next waypoint) and is used when the driver has intentionally deviated from the originally calculated route. (EX1003, ¶194; EX1006 at 10:23-59.)



(EX1006 at FIG. 2 (annotated).)

5. Khavakh In Combination With Lefebvre And The Knowledge Of A POSITA Renders Obvious Dependent Challenged Claims 2, 7-12, And 16-17.

(a) Challenged Claim 2.

Khavakh in combination with Lefebvre teaches and renders obvious the additional limitations of Challenged Claim 2 (*i.e.*, “wherein when the command is inputted from the input unit, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route”).

In the proposed combination, when a command to execute Lefebvre’s “plan a new route” option or the “guide me back to planned route” option is inputted from the keypad, keyboard, or microphone (*i.e.*, the input unit), the display 27 (*i.e.*, the output unit) deletes the off route display 20 (*i.e.*, the message which the output unit outputs) and the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route. (EX1003, ¶197; EX1006 at 9:43-66, 10:4-16; EX1005 at 30:17-20, claim 9.)

(b) Challenged Claim 7.

Khavakh in combination with Lefebvre teaches and renders obvious the additional limitations of Challenged Claim 7 (*i.e.*, “wherein when the command indicating that the vehicle travels via the first next waypoint is inputted, the route searching unit re-searches for a new whole route leading to the destination via said first next waypoint”).

In the proposed combination, when the command indicating that the vehicle travels via the first next waypoint (*i.e.*, a command to execute the “plan a new route” option or the “guide me back to planned route” option) is inputted, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the destination via the first next waypoint. (EX1003, ¶200; EX1006 at 9:43-66, 10:4-16; EX1005 at 8:21-26, 10:8-15, 13:56-61, 22:55-23:3, 30:17-20, 32:35-54, claim 9.)

(c) Challenged Claim 8.

Khavakh in combination with Lefebvre and the knowledge of a POSITA teaches and renders obvious the additional limitations of Challenged Claim 8 (*i.e.*, “wherein the output unit includes a display unit, and the input unit inputs the command according to either pushing down of a button displayed on a screen of said display unit, or voice”). (EX1003, ¶¶202-206.)

Khavakh’s output unit includes a display 27 (*i.e.*, a display unit). (EX1005 at 4:19-22.)

Khavakh’s input unit includes a microphone and a voice recognition program for inputting the claimed command according to voice. (*Id.* at 4:16-19.)

While Khavakh does not expressly disclose a display that can input a command according to pushing down a button displayed on the screen of the display (*i.e.*, a touchscreen), it would have been obvious to modify Khavakh’s display 27 to

be a touchscreen display. (EX1003, ¶204.) Prior to the alleged invention of the ‘971 patent, touchscreen displays were well known and widely used in navigation devices. (*Id.*, ¶205.) A POSITA would have been motivated to modify Khavakh’s display 27 to be a touchscreen because touchscreens provide a clear, simple, easy-to-use user interface that saves space by eliminating the need for additional hardware (*e.g.*, a keypad or keyboard) that can be difficult and distracting to use while driving (thus increasing safety). (*Id.*) A POSITA would have had a reasonable expectation of success because touchscreens were widely used and well understood prior to the alleged invention of the ‘971 patent, and the proposed modification would have comprised the simple substitution of one piece of well-known hardware for another. (*Id.*)¹⁴

(d) Challenged Claim 9.

Khavakh in combination with Lefebvre and the knowledge of a POSITA renders obvious the additional limitations of Challenged Claim 9 (*i.e.*, “wherein when the command is not inputted from the input unit even if a predetermined period of time has elapsed after the output unit outputs the message showing that the vehicle

¹⁴ The ‘971 patent provides no technical detail regarding touchscreens (EX1001 at 3:15-23), which supports that implementing a touchscreen would have been conventional for a POSITA. *In re Buchner*, 929 F.2d at 661.

has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route”). (EX1003, ¶¶207-213.)

Lefebvre provides extensive detail regarding what happens after a driver selects one of the recovery options from the recovery option table portion 29 of off route display 20. (EX1006 at FIG. 3C, 9:43-11:41.) However, Lefebvre does not specify what happens if the driver fails to notice, or forgets to respond to, the off route display 20. (*Id.*; EX1003, ¶208.) A POSITA would have recognized that Khavakh itself teaches what to do in such a scenario. (EX1003, ¶209.) Khavakh teaches that a “reroute function can be implemented automatically without waiting for the end-user to request that rerouting be performed.” (EX1005 at 30:20-22.) When Khavakh’s automatic reroute function is activated, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination via the bypassed first next waypoint. (*Id.* at 29:40-55, 30:19-20, 30:33-60; EX1003, ¶209.)

A POSITA would have found it obvious to execute Khavakh’s automatic reroute function when the driver fails to select one of the route recovery options from the recovery option table portion 29 (*i.e.*, fails to input a command using the input unit) after a predetermined period of time has elapsed after the output unit outputs

the off route display 20 (*i.e.*, outputs the message showing that the vehicle has deviated from the route). (EX1003, ¶¶210-212.)

A POSITA would have known that if the driver fails to respond to the off route display 20 after a certain period of time has elapsed, then it is reasonable to assume that the driver has failed to notice, or has forgotten to respond to, the off route display 20. (EX1003, ¶211.) A POSITA also would have known that without some sort of intervention in the above scenario, the driver may unwittingly continue driving further away from the calculated route for an indefinite period. (*Id.*)

A POSITA would have been motivated to execute Khavakh's automatic reroute function after a predetermined period of inaction has elapsed to minimize the extent of the driver's deviation from the calculated route. (*Id.*, ¶212.) A POSITA also would have been motivated to delete the off route display 20 when the automatic reroute function is executed so that the driver can see the new driving directions and "since the vehicle is no longer off route because a new route is now calculated for the vehicle from its present position." (*Id.*; EX1006 at 9:63-66.)

(e) Challenged Claim 10.

Khavakh in combination with Lefebvre teaches and renders obvious the additional limitations of Challenged Claim 10 (*i.e.*, "wherein when the route guidance unit determines that the vehicle has deviated from the route to the predetermined distance or more in a state in which the output unit outputs the

message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route”).

As discussed above with respect to limitation [19d], when the route guidance tool 91 or the route guidance program in navigation application 47 (*i.e.*, the route guidance unit) determines that the vehicle has deviated from the route to the predetermined distance or more, the navigation system 10 enters a state in which the display 27 (*i.e.*, the output unit) outputs the off route display 20 (*i.e.*, the message showing that the vehicle has deviated from the route). (EX1003, ¶215.) The output unit then deletes the message and the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route when a command to execute the “plan a new route” option or the “guide me back to planned route” option is inputted from the input unit. (*Id.*; EX1006 at 9:43-66, 10:4-16, FIG. 3C.)

(f) Challenged Claim 11.

Khavakh teaches the additional limitations of Challenged Claim 11 (*i.e.*, “wherein the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint”).

As discussed above with respect to Challenged Claim 9, when Khavakh’s automatic reroute function is activated, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination

via the bypassed first next waypoint. (EX1005 at 29:40-55, 30:19-20, 30:33-60; EX1003, ¶218.)

(g) Challenged Claim 12.

Khavakh in combination with Lefebvre teaches and renders obvious the additional limitations of Challenged Claim 12 (*i.e.*, “wherein the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint”).

In the proposed combination, when a command to execute the “plan a new route” option or the “guide me back to planned route” option is inputted, Lefebvre’s route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the destination via the first next waypoint. (EX1003, ¶220; EX1006 at 9:43-66, 10:4-16, FIG. 3C; EX1005 at 29:40-55, 30:19-20, 30:33-60.)

(h) Challenged Claim 16.

Khavakh in combination with Lefebvre and the knowledge of a POSITA renders obvious the additional limitations of Challenged Claim 16 (*i.e.*, “wherein when the command is not inputted from the input unit even if a predetermined period of time has elapsed after the output unit outputs the message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint, a new whole route leading to the

destination via another waypoint when the other waypoint exists forward of said first next waypoint, or a new whole route leading to the destination when no other waypoint exists forward of said first next waypoint”).

As demonstrated above with respect to Challenged Claim 9, a POSITA would have found it obvious to delete off route display 20 (*i.e.*, the message showing that the vehicle has deviated from the route) and execute Khavakh’s automatic reroute function when the driver fails to select one of the route recovery options from the recovery option table portion 29 (*i.e.*, fails to input a command using the input unit) after a predetermined period of time has elapsed after the output unit outputs the off route display 20. (EX1003, ¶223.) When Khavakh’s automatic reroute function is activated, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination via the bypassed first next waypoint. (*Id.*, ¶224; EX1005 at 29:40-55, 30:19-20, 30:33-60.)¹⁵

(i) Challenged Claim 17.

Khavakh in combination with Lefebvre and the knowledge of a POSITA renders obvious the additional limitations of Challenged Claim 17 (*i.e.*, “wherein

¹⁵ Challenged Claims 16 and 17 list several route re-search options using a disjunctive “or.” (EX1001 at claims 16-17.) The prior art need only teach one of the listed route re-search options to satisfy the claims. *SkinMedica*, 727 F.3d at 1199.

when the command is not inputted from the input unit even if the vehicle travels a fixed distance after the output unit outputs the message showing that the vehicle has deviated from the route, the output unit deletes the message which said output unit outputs and the route searching unit re-searches for a new whole route leading to the destination via the first next waypoint, a new whole route leading to the destination via another waypoint when the other waypoint exists forward of said first next waypoint, or a new whole route leading to the destination when no other waypoint exists forward of said first next waypoint”).

As demonstrated above with respect to Challenged Claim 9, a POSITA would have found it obvious to delete off route display 20 (*i.e.*, the message showing that the vehicle has deviated from the route) and execute Khavakh’s automatic reroute function when the driver fails to select one of the route recovery options from the recovery option table portion 29 (*i.e.*, fails to input a command using the input unit) after a certain inactivity period has elapsed after the output unit outputs the off route display 20. (EX1003, ¶227.) When Khavakh’s automatic reroute function is activated, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination via the bypassed first next waypoint. (*Id.*; EX1005 at 29:40-55, 30:19-20, 30:33-60.)

A POSITA would have recognized that there were only a finite number of known ways to determine when to execute Khavakh’s automatic reroute function

(e.g., elapsed time or vehicle driving distance) and that either option would have provided a satisfactory estimate of when intervention is needed due to driver inactivity. (EX1003, ¶228; EX1006 at 3:66-4:1.) A POSITA would have found it obvious to execute Khavakh’s automatic reroute function when the driver fails to select one of the route recovery options from the recovery option table portion 29 after the vehicle has traveled a predetermined distance after the output unit outputs the off route display 20. (EX1003, ¶228; *see also KSR*, 550 U.S. at 421; *Nike, Inc. v. Adidas AG*, Appeal No. 2021-1903, 2022 WL 4002668 at *8 (Fed. Cir. Sept. 1, 2022).)

B. GROUND 2: Khavakh In Combination With Lefebvre, RDX, And The Knowledge Of A POSITA Renders Obvious Challenged Claims 3-4 And 14.

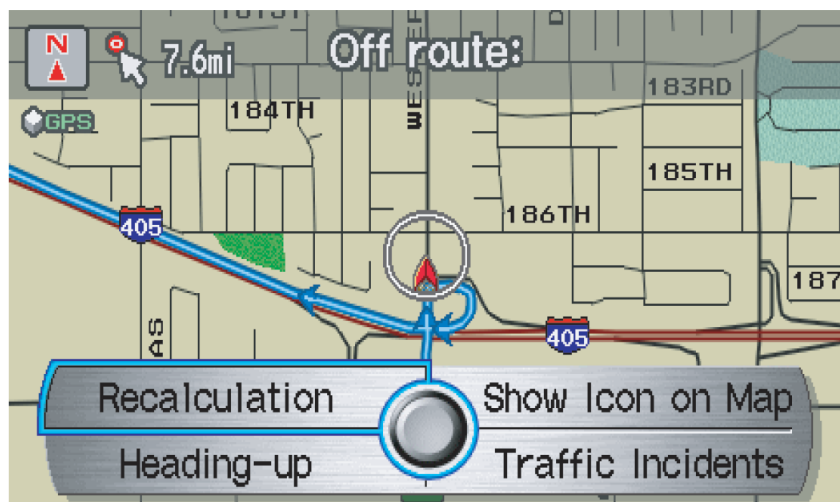
1. Overview Of RDX.

RDX is a printed publication that was publicly accessible no later than September 13, 2007, and is thus prior art under pre-AIA §102(a). (EX1012, ¶¶18-23.) RDX was not cited during prosecution of the ‘971 patent.

RDX is generally directed to a GPS-based vehicular “navigation system.” (EX1007 at 5.) RDX’s navigation system calculates a route to a driver-entered destination and “provides map and voice guidance” as the driver drives. (*Id.* at 6.) RDX’s navigation system is also capable of setting one or more intermediate waypoints along a calculated route to a destination. (*Id.* at 71.) “Waypoints are

routed to in the order they were entered (number 1 first, etc.), with [the] final destination routed to last.” (*Id.*) “When [the driver] enter[s] waypoints, they appear on the map screen as small red flags numbered 1-5.” (*Id.*) RDX’s navigation system also allows the driver to delete waypoints. (*Id.* at 72.) When a waypoint is deleted, the “route is re-calculated to reflect the changes [the driver] made to the waypoint(s).” (*Id.*)

According to RDX and as shown below, if the driver leaves the calculated route while driving, RDX’s navigation system will generate an “Off route” message that appears at the top of the display along with an option to perform a “Recalculation.” (*Id.* at 67; *see also id.* at 91.) If the driver selects the “Recalculation” option from the displayed menu, RDX’s navigation system “will recalculate the route from [the] current location and direction to the desired destination then give [the user] a new route instruction.” (*Id.*)



(*Id.* at 67.)

RDX is analogous art to the ‘971 patent as RDX is in the same field of endeavor as the ‘971 patent (*i.e.*, navigation devices that carry out route guidance) and is reasonably pertinent to a problem addressed by the ‘971 patent (*i.e.*, allowing the user to determine how to respond to an off route condition). (EX1001 at 1:5-10, 1:48-62; EX1007 at 5-6, 67, 91; EX1003, ¶91.)

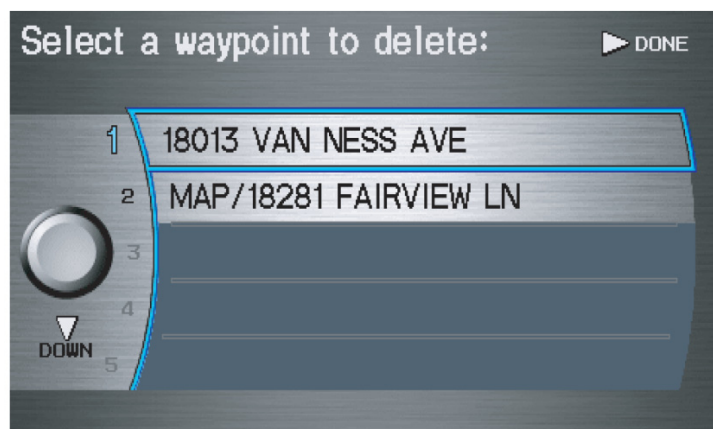
2. Motivation To Combine Khavakh And Lefebvre With RDX.

Lefebvre discloses that one of the benefits of its off route display 20 is to provide the driver with numerous recovery options. (EX1006 at 3:63-4:3, 5:43-58, 8:31-37, 11:51-53.) One of Lefebvre’s recovery options—the suspend route guidance option—allows the driver to suspend route guidance when the driver intentionally deviates from the calculated route (*e.g.*, to take a side trip). (*Id.* at 10:23-34.) The driver can then later choose to resume route guidance to the previously specified waypoints and destination. (*Id.* at 10:34-45.) Another recovery option of Lefebvre is the add detours option, which allows the driver to add “roads or areas to be avoided” to the route. (*Id.* at 10:60-67.) When the add detours option is selected, the navigation system calculates a new route to the previously set waypoints and destination that avoids the roads and areas the driver specified. (*Id.* at 10:68-11:11; EX1003, ¶¶230-231.)

While Lefebvre recognizes that a driver may desire to intentionally deviate from the calculated route or may desire to avoid a specific area, a POSITA would

have recognized that Lefebvre’s recovery options do not account for the scenario where the driver intentionally deviates from the calculated route to avoid a waypoint but wants to continue route guidance to the destination without being directed to the bypassed waypoint. (EX1003, ¶232.)

In the same field of endeavor, RDX discloses a navigation system that allows the driver to set a destination and one or more intermediate waypoints. (EX1007 at 5-6, 71.) After the waypoints and destination are set, the navigation system guides the driver to the destination via the waypoints in the order the waypoints were entered. (*Id.* at 71.) RDX’s navigation system also allows the driver to delete waypoints using the menu shown below. (*Id.* at 72.) When a waypoint is deleted, the “route is re-calculated to reflect the changes [the driver] made to the waypoint(s).” (*Id.*) In other words, when a waypoint is deleted, the navigation system will re-calculate a route that guides the driver to the originally specified destination without guiding the driver to the deleted waypoint. (*Id.*; EX1003, ¶233.)



(EX1007 at 72.)

A POSITA would have been motivated to combine Khavakh and Lefebvre with RDX's waypoint deletion menu, with the waypoint deletion menu being implemented as a sub-menu under either the add detours option or a separate seventh route recovery option. (EX1003, ¶234.) The proposed combination would have beneficially provided the driver with greater off route recovery flexibility, which is consistent with the goal of Lefebvre's off route display 20. (*Id.*, ¶235; EX1006 at 5:54-58, 10:20-22.)

For example, the proposed combination would have desirably allowed the driver to intentionally bypass a waypoint without cancelling route guidance and without being directed back to the bypassed waypoint. (EX1003, ¶235.) Instead, the user would simply delete the bypassed waypoint using the waypoint deletion menu, and the system would automatically re-calculate a route to the original destination without guiding the driver to the bypassed waypoint. (*Id.*; EX1007 at 72.) This would avoid the unwanted scenario where, when the driver intentionally bypasses a waypoint, the driver is forced to either (i) cancel route guidance and then manually re-enter the waypoints and destination that the driver still wants to travel to; or (ii) continue route guidance and be directed to a waypoint that the driver no longer wants to travel to. (EX1003, ¶235.) Both scenarios are undesirably frustrating and time consuming, with the former scenario also being potentially dangerous if the driver attempts to re-enter the destination and waypoints while

driving. (*Id.*) Thus, a POSITA would have been motivated to combine Khavakh and Lefebvre with RDX to increase off route recovery flexibility, driver convenience and satisfaction, system and route efficiency, and driver safety through minimizing manual user inputs and leveraging automation. (*Id.*)

Additionally, Lefebvre itself acknowledges that “further modifications and improvements will occur to those skilled in the art” such as “providing additional off route recovery options in addition to those described,” and that “[a]ll such modifications which retain the basic underlying principles disclosed and claimed herein are within the scope of this invention.” (EX1006 at 12:5-12.) Thus, Lefebvre invites a POSITA to make the proposed combination. (EX1003, ¶236.) The proposed combination would have desirably allowed the driver to avoid not only roads and areas, but waypoints as well, and would have provided greater flexibility to drivers who intentionally deviate from a calculated route. (*Id.*)

A POSITA would have had a reasonable expectation of success in combining Khavakh and Lefebvre with RDX’s waypoint deletion menu. (EX1003, ¶237.) A POSITA would have recognized that Khavakh already has software for inputting and modifying waypoints. (*Id.*; EX1005 at 4:7-13, 8:52-65, 13:47-61.) The proposed combination would have merely required routine, straightforward adjustments to the programming in Khavakh’s navigation system (*i.e.*, simply

adding a new menu option) and would have been well within the skill set of a POSITA. (EX1003, ¶237.)¹⁶

3. Challenged Claim 3.

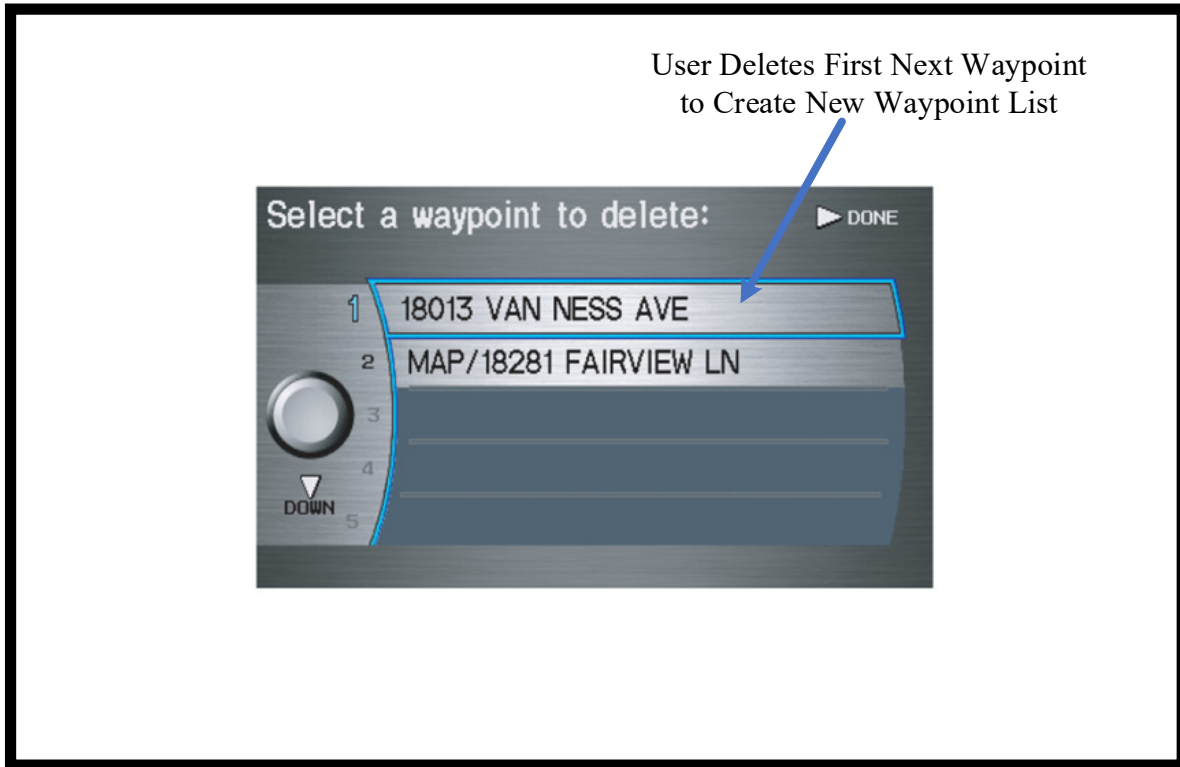
Khavakh in combination with Lefebvre and RDX teaches and renders obvious the additional limitations of Challenged Claim 3 (*i.e.*, “wherein when the command indicating that the vehicle does not travel via the first next waypoint is inputted, the output unit outputs a waypoint list in which a list of the waypoints set by the setting unit is shown, and the route searching unit re-searches for a new whole route according to a new waypoint list which is acquired by changing the waypoint list outputted by said output unit by using said input unit”). (EX1003, ¶¶238-241.)

As discussed above, a POSITA would have been motivated to combine Khavakh and Lefebvre with RDX’s waypoint deletion menu, with the waypoint deletion menu being implemented as a sub-menu under either the add detours option or a separate seventh route recovery option. (EX1003, ¶239.) In the proposed combination, when the driver selects the add detours option (or, alternatively, a separate seventh route recovery option) from the off route display 20, the display 27

¹⁶ The ‘971 patent provides no technical detail regarding outputting a waypoint list (EX1001 at 10:1-19), which supports that the proposed modification would have been conventional for a POSITA to implement. *In re Buchner*, 929 F.2d at 661.

(*i.e.*, the output unit) outputs the waypoint deletion menu, which is a list showing all the waypoints set by the setting unit (*i.e.*, a waypoint list). (*Id.*; EX1007 at 71-72.) The command to bring up the waypoint deletion menu is a command indicating that the vehicle does not travel via the first next waypoint because, as discussed below, the waypoint deletion menu is a menu used to remove waypoints that the driver does not wish to travel to. (EX1003, ¶239; EX1007 at 72.)

Once the waypoint deletion menu is displayed, the driver can delete the bypassed first next waypoint using an input device, as shown below. (EX1007 at 72.) Deleting the first next waypoint using the input device creates a new waypoint list that no longer contains the deleted first next waypoint. (*Id.*) The route calculation tool 40 (*i.e.*, the route searching unit) then re-searches for a new whole route leading to the original destination via the waypoints that remain in the new waypoint list. (*Id.*; EX1003, ¶240.)



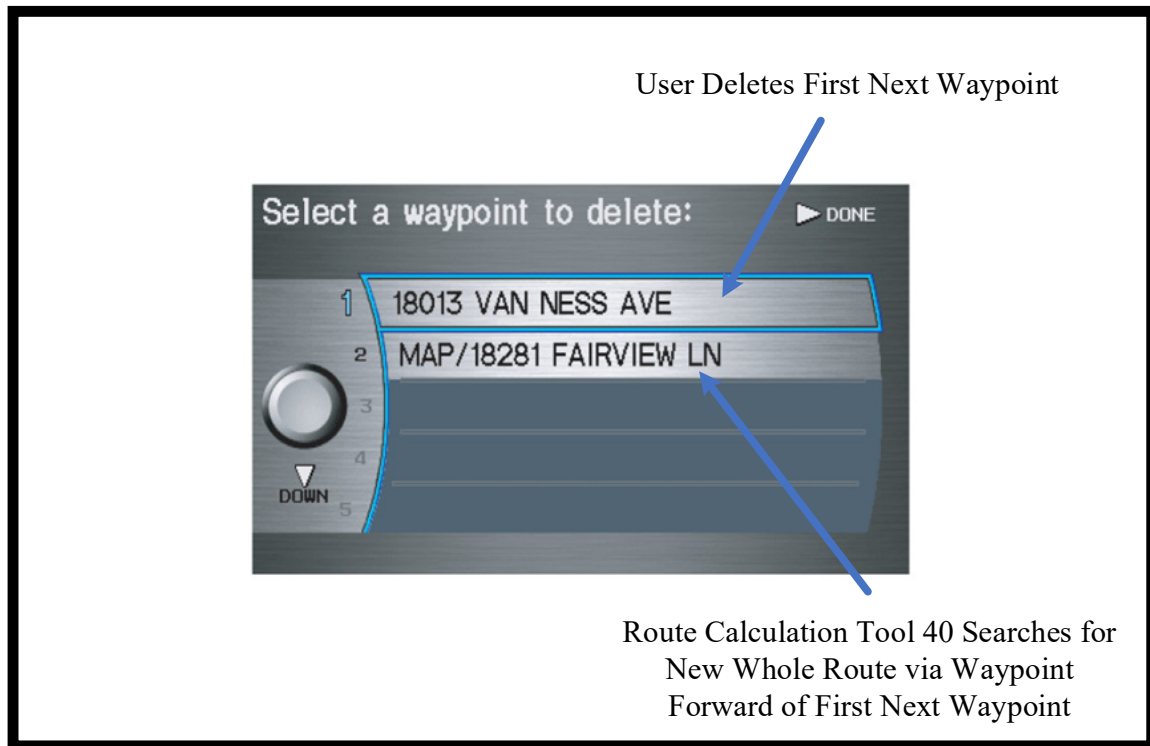
(EX1007 at 72 (annotated).)

4. Challenged Claim 4.

Khavakh in combination with Lefebvre and RDX teaches and renders obvious the additional limitations of Challenged Claim 4 (*i.e.*, “wherein when the command indicating that the vehicle does not travel via the first next waypoint is inputted, the route searching unit re-searches for a new whole route leading to the destination via another waypoint when the other waypoint exists forward of the first next waypoint, or re-searches for a new whole route leading to the destination when no other waypoint exists forward of the first next waypoint”). (EX1003, ¶¶242-245.)

As discussed above, a POSITA would have been motivated to combine Khavakh and Lefebvre with RDX’s waypoint deletion menu. (EX1003, ¶243.) As

shown below, in the proposed combination when the driver deletes the first next waypoint using the waypoint deletion menu, the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination via the non-deleted waypoint that remains in the waypoint list (*i.e.*, a waypoint forward of the first next waypoint). (*Id.*; EX1007 at 72; *see also id.* at 71 (“Waypoints are routed to in the order they were entered (number 1 first, etc.)”).) A POSITA would have understood that if no waypoint remains after the first next waypoint is deleted (*i.e.*, no other waypoint exists forward of the first next waypoint), then the route calculation tool 40 will re-search for a new whole route leading to the original destination. (EX1003, ¶243; EX1007 at 71-72.)



(EX1007 at 72 (annotated).)

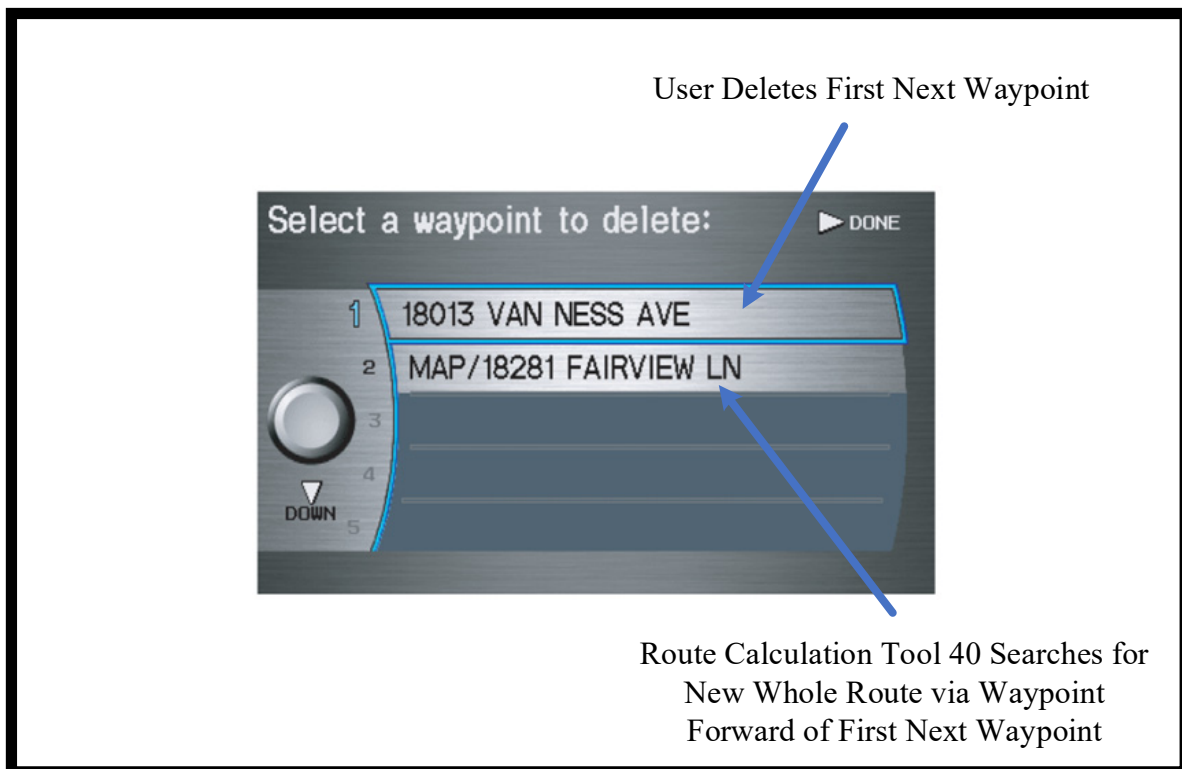
A POSITA would also have understood that inputting a command to delete the first next waypoint using the waypoint deletion menu discloses inputting a command indicating that the vehicle does not travel via the first next waypoint because deleting the first next waypoint causes a new route to be calculated that does not include the deleted first next waypoint. (EX1003, ¶244; EX1007 at 72.) Indeed, Patent Owner has asserted in a district court proceeding involving the ‘971 patent that a command to delete a waypoint reads on the claimed “command indicating that the vehicle does not travel via the first next waypoint.” (EX1011 at 14-15.)

5. Challenged Claim 14.

Khavakh in combination with Lefebvre and RDX teaches and renders obvious the additional limitations of Challenged Claim 14 (*i.e.*, “wherein the route searching unit re-searches for a new whole route leading to the destination via another waypoint when the other waypoint exists forward of the first next waypoint, or re-searches for a new whole route leading to the destination when no other waypoint exists forward of the first next waypoint”). (EX1003, ¶¶246-248.)

In the proposed combination, when the driver deletes the first next waypoint using the waypoint deletion menu and selects “done,” the waypoint deletion menu is deleted and the route calculation tool 40 (*i.e.*, the route searching unit) re-searches for a new whole route leading to the original destination via the non-deleted waypoint that remains in the waypoint list (*i.e.*, a waypoint forward of the first next

waypoint). (EX1007 at 72; *see also id.* at 71 (“Waypoints are routed to in the order they were entered (number 1 first, etc.)”); EX1003, ¶247.) A POSITA would have understood that if no waypoint remains after the first next waypoint is deleted (*i.e.*, no other waypoint exists forward of the first next waypoint), then the route calculation tool 40 re-searches for a new whole route leading to the original destination. (EX1003, ¶247; EX1007 at 71-72.)



(EX1007 at 72 (annotated).)

V. DISCRETIONARY DENIAL IS UNWARRANTED

A. *Fintiv*.

Patent Owner has asserted the ‘971 patent against Petitioner in a case 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. (EX1021 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. (EX1021 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 '971 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.*, Khavakh, Lefebvre, and RDX) asserted in this Petition to challenge the validity of the Challenged Claims of the ‘971 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. The Grounds raised in the Petition (or the references contained therein) have not been previously considered by the PTO. Thus, discretionary denial is inappropriate in view of the compelling evidence of unpatentability presented in the Petition.

B. *Advanced Bionics.*

The Board should also decline to exercise its discretion to deny institution under 35 U.S.C. § 325(d) because 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 ‘971 patent. As noted above, the prior art raised in the Petition’s Grounds was neither cited by the Examiner nor identified by the Applicant in an information disclosure statement. The prior art raised in the Grounds is also materially different from, and not cumulative of, any art before the Examiner such that the Petition’s art and arguments are not the same or substantially the same as those before the Examiner. For example, the prior art raised herein teaches the claimed “outputting a message” and “inputting a command” limitations that the Examiner found was missing from the art cited during prosecution. (EX1002 at 590.)

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

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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 13,911 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 '971 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 address:

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