

Petition for *Inter Partes* Review

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION  
AUTHORITY

Petitioner

v.

TRANSPORT TECHNOLOGIES, LLC

Patent Owner

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Case No. IPR2016-\_\_\_\_\_

Patent No. 6,980,101

**PETITION FOR *INTER PARTES* REVIEW**

**UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.***

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**EXHIBIT LIST FOR INTER PARTES REVIEW OF**  
**U.S. PATENT NO. 6,980,101**

No.	Description
1001	U.S. Patent No. 6,980,101
1002	Prosecution History of U.S. Patent No. 6,980,101
1003	Complaint for Patent Infringement, <i>Transport Techs., LLC v. L.A. County Metro. Transp. Auth.</i> , Case No. 2:15-cv-6423-RSWL (MRW), Dkt. 1 (C.D. Cal. Aug. 21, 2015)
1004	U.S. Patent No. 5,289,183
1005	<i>Automated Vehicle Occupancy Monitoring Systems For Hov/Hot Facilities</i> , published December 16, 2004 by the McCormick Rankin Corporation
1006	U.S. Patent No. 5,086,389
1007	Declaration of Anthony Wing
1008	Declaration of Scott Andrews
1009	Curriculum Vitae of Scott Andrews
1010	<i>Deployment of ITS/DSRC Applications: Status, Issues, and Options</i> , by Vijay M. Patel and Carl W. Kain Mitretek Systems, Proceedings of the Third World Congress on Intelligent Transport Systems, Orlando, Fla., Oct. 14–18, 1996
1011	<i>Design And Assessment Of In-Vehicle Interfaces For Electronic Toll Collection</i> , J. Sutherland and A. Stevens of the Transport Research Laboratory, Published in the Proceedings of the 4th World Congress World Congress on Intelligent Transport Systems, Berlin, Germany, October 21–24, 1997
1012	<i>Development of 5.8GHz Active Communication System for ETC</i> , Shinichi Taniguchi, Norimasa Hiramatsu, Mitsuyuki Banno of Toyota Motor Corporation, Published in the Proceedings of the 4th World Congress World Congress on Intelligent Transport Systems, Berlin, Germany, October 21–24
1013	Technical Memorandum No. 32, <i>ITS Corridor Master Plans for Florida's Principal FHHS Limited Access Corridors</i> , published by the Florida Department of Transportation, 2002
1014	U.S. Patent No. 7,237,715



Los Angeles County Metropolitan Transportation Authority (Petitioner) petitions for *inter partes* review in accordance with 35 U.S.C. §§ 311–319 and 37 C.F.R. § 42.100, *et seq.* of claims 1, 3, 5, 6, 8, and 10 (Challenged Claims) of U.S. Patent No. 6,980,101 (the '101 patent (Ex. 1001)), which issued December 27, 2005 and is purportedly assigned to Transportation Technologies, LLC (Patent Owner). There is a reasonable likelihood that Petitioner will prevail on at least one Challenged Claim.

## **I. NOTICES AND STATEMENTS**

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

Los Angeles County Metropolitan Transportation Authority, Clark Construction Group LLC, and Atkinson Contractors LP are the real parties-in-interest.

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

The '101 patent is involved in litigation pending in the Central District of California. That case is *Transport Techs., LLC v. L.A. County Metro. Transp. Auth.*, Case No. 2:15-cv-6423-RSWL (MRW), filed on August 21, 2015 and presently before Hon. Ronald S. W. Lew.

### **C. Lead and Back-up Counsel Under 37 C.F.R. § 42.8(b)(3)**

Petitioner designates Robert A. Auchter, Reg. No. 38,069, as lead counsel. Mr. Auchter is available at 1999 K Street, NW; Suite 600; Washington, DC 20006 and at telephone number (202) 370-8303 and fax number (202) 370-8344.

Petitioner designates Christopher J. Mierzejewski, Reg. No. 72,889, as back-up counsel. Mr. Mierzejewski is available at 300 W. 6th Street; Suite 1700; Austin, Texas 78701 and at telephone number (512) 692-8740 and fax number (512) 692-8744.

**D. Service Information Under 37 C.F.R. § 42.104(A)**

Please address all correspondence and service to counsel at the above addresses, or via electronic service by email at 02526-00001\_IPR101@McKoolSmith.com.

**II. PAYMENT OF FEES UNDER 37 C.F.R. § 42.103**

This Petition for IPR, which requests review of six claims (1, 3, 5, 6, 8, and 10) of the '101 patent, and which is accompanied by a payment of \$23,000, meets the fee requirements under 35 U.S.C. § 312(a)(1). The Patent and Trademark Office (the "Office") is authorized to charge Deposit Account No. 50-5723 referencing matter no. 02526.00001 in the fee amount required for this Petition, as set in 37 C.F.R. § 42.15(a), and payment for any additional fees.

**III. GROUNDS FOR STANDING UNDER 37 C.F.R. § 42.104(A)**

Petitioner certifies that the '101 patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the '101 patent claims on the grounds identified in this Petition. The present Petition is being filed within one year of receipt of service of Patent Owner's litigation complaint, which alleged infringement of the '101 patent and

was filed in Case No. 2:15-cv-6423-RSWL (MRW) on August 21, 2015. (Ex. 1003).

#### **IV. SUMMARY OF THE '101 PATENT**

##### **A. Background**

The '101 patent was filed on March 14, 2005 and issued December 27, 2005. The named inventor of the '101 patent is Kalon Lee Kelley. The '101 patent was allegedly assigned to Patent Owner on January 17, 2014. (Ex. 1002, '101 Prosecution History at 2).

The '101 patent includes two independent claims (1 and 6), both of which are being challenged. The '101 patent also includes eight dependent claims, four of which are being challenged.

The '101 patent's abstract describes the invention as follows:

A system that allows a claim by a registrant as to the number of occupants traveling in a vehicle over a section of highway . . . . The registrant is identified by a registrant identifier. The claim about occupancy is optionally visually displayed as the vehicle traverses the highway. The identification of the registrant making the claim is captured by a plurality of reading devices along the highway and transferred to a central processing system. . . .

(Ex. 1001 at Abstract).

## **B. Person of Ordinary Skill in the Art**

A person of ordinary skill in the art for the '101 patent would have a Bachelor of Science in Electrical or Computer Engineering or the equivalent, plus two years of experience with automated toll roads, intelligent transportation systems, RFID tracking systems, or similar experience. (Ex. 1008 at ¶49).

## **C. The Prosecution History**

The '101 patent's application was made special due to the age of the named inventor. (Ex. 1002 at 17). The '101 patent allowed all claims on the first office action. (Ex. 1002 at 8). The stated reason for allowance was:

The primary reason for allowance is the inclusion of a system for a registrant to claim occupancy of a vehicle, wherein a data collector interrogates a vehicle so as to determine the occupancy of the vehicle and transfers the information to a central processing facility.

(Ex. 1002 at 9).

The named inventor did not disclose any prior art references during prosecution. All three cited references listed on the face of the patent were cited by the examiner. (Ex. 1001; Ex. 1002 at 11). The prior art references argued in this petition were not cited references for the '101 patent.

## **D. Claim Construction**

For the purposes of this petition and any resulting *inter partes* review, the claim terms should be construed under the broadest reasonable interpretation. *In re*

*Cuozzo*, 793 F.3d 1268, 1271 (Fed. Cir. 2015), *cert. granted*, 136 S. Ct. 890 (2016).

1. Preambles of the Challenged Claims Are Not Limiting

Petitioner urges that under broadest reasonable interpretation, the preambles of both independent claims 1 and 6 are non-limiting. District courts may construe preambles as either limiting or non-limiting, on a case-by-case basis. (MPEP § 2111.02). Construing the preambles as non-limiting is a broader interpretation than construing the preambles to be limiting. As a district court generally has the option to construe preambles as non-limiting, the Board should examine the Challenged Claims on *inter partes* review as if the preambles are non-limiting to avoid using a narrower construction than might be used in a district court proceeding.

In case the Board construes the preambles as limiting, Petitioner also shows how the preambles of the Challenged Claims are met by the prior art.

**V. DETAILED EXPLANATION OF GROUNDS FOR INVALIDITY**

Ground 1: Claims 1, 3, 6, and 8 of the '101 patent are invalid under 35 U.S.C. § 103 as obvious in light of U.S. Patent No. 5,289,183, issued February 22, 1994. (Hassett '183 (Ex. 1004)).

Ground 2: Claims 1, 3, 6, and 8 of the '101 patent are invalid under 35 U.S.C. § 102 as anticipated by U.S. Patent No. 5,289,183, issued February 22, 1994. (Ex. 1004).

Ground 3: Claims 1, 3, 5, 6, 8, and 10 of the '101 patent are invalid under 35 U.S.C. § 103 as obvious in light of AUTOMATED VEHICLE OCCUPANCY MONITORING SYSTEMS FOR HOV/HOT FACILITIES, published December 16, 2004 by the McCormick Rankin Corporation. (The Ontario Report (Ex. 1005)).

Ground 4: Claims 1, 3, 5, 6, 8, and 10 of the '101 patent are invalid under 35 U.S.C. § 102 as anticipated by AUTOMATED VEHICLE OCCUPANCY MONITORING SYSTEMS FOR HOV/HOT FACILITIES, published December 16, 2004 by the McCormick Rankin Corporation. (Ex. 1005).

Ground 5: Claims 1, 3, 5, 6, 8, and 10 of the '101 patent are invalid under 35 U.S.C. § 103 as obvious in light of the combination of Hassett '183 and the Ontario Report.

Ground 6: Claims 1, 3, 5, 6, 8, and 10 of the '101 patent are invalid under 35 U.S.C. § 103 as obvious in light of the combination of Hassett '183 and U.S. Patent No. 5,086,389, issued February 4, 1992. (Hassett '389 (Ex. 1006)).

**A. [Ground 1] – Obviousness in Light of Hassett '183**

Hassett '183 renders claims 1, 3, 6, and 8 of the '101 patent obvious. (Ex. 1008 at 41).

## 1. Overview of Hassett '183

Hassett '183 is 102(b) prior art to the '101 patent. Hassett '183 was filed on June 19, 1992 and issued on February 22, 1994, over 11 years before the '101 patent was filed.

Hassett '183 discloses using a vehicle transponder and roadside transceivers to collect information such as a vehicle's number of passengers, entrance point, and exit point on a roadway. (Ex. 1004 at Abstract). This information, along with an "identifying signal for the transponder" (Ex. 1004 at 2:48–51), is sent to a central data processor, (Ex. 1004 at 2:51–56) and can be used for calculating tolls, (Ex. 1004 at 3:1–3) and for planning and management purposes, (Ex. 1004 at 1:28–40).

## 2. Claim 1 is obvious in light of Hassett '183

- a. "A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway:"

Hassett '183 discloses the vehicle operator (the claimed "registrant") using a keypad to enter (*i.e.*, "claim") the "number of passengers" into the vehicle's transponder. (Ex. 1004 at 5:28–32). The vehicle transponder communicates the claimed "number of passengers" to roadside transceivers (Ex. 1004 at Abstract), as the vehicle "traverse[s] a roadway" (Ex. 1004 at 1:18–23), such as a toll road (Ex. 1004 at 5:34–35), or a "multi-lane, divided highway[]" (Ex. 1004 at 3:39–42).

The highway has roadside transceivers, such as at entry points and exit points. (Ex. 1004 at 2:65–3:1).

The Hassett '183 system is a “vehicle occupancy monitoring system” as it discloses collecting information about the number of passengers in a vehicle. (Ex. 1008 at 58–59; *e.g.*, Ex. 1004 at Abstract (“collect information such as . . . number of passengers in each vehicle”)).

The disclosed “vehicle operator” (*i.e.*, driver) of Hassett '183 satisfies the claimed “registrant” of the '101 patent. (Ex. 1008 ¶¶64). The '101 specification explains that the claimed “registrant” may be the driver of the vehicle. (Ex. 1001 at 3:6–8 (“The driver would, upon registration, acquire a number of these devices uniquely identifying the registrant . . . .”)).<sup>1</sup> Under a broadest reasonable interpretation the driver (or anyone else in the car with access to the device interface) could be the claimed “registrant” “claiming” the number of occupants,

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<sup>1</sup> To the extent patent owner argues the “vehicle operator” does not disclose the “registrant,” a person of ordinary skill in the art would have found it obvious for the Hassett '183 system to allow the “vehicle operator” to also be the claimed “registrant,” or to allow someone else, such as a parent or spouse, to be the claimed “registrant” and still satisfy the '101 patent’s claims. (Ex. 1008 ¶¶64–65). The '101 patent itself discloses the vehicle “driver” as the “registrant.” (Ex. 1001 at 1:59–64).



not only limited to the particular person who had actually registered with the program administrator. (Ex. 1008 ¶103).

Hassett '183 allows the driver (the claimed “registrant”) to input the number of passengers into the system, thus making a “claim” about the number of occupants in the vehicle, similar to the '101 patent’s disclosure. (Ex. 1008 ¶¶64–66; Ex. 1004 at 5:28–32 (entering number of passengers by keypad); Ex. 1001 at 2:60–66 (specifying occupancy using a “multiple position switch”)).

Hassett '183’s “number of passengers” discloses the claimed “number of occupants,” or renders it obvious. (Ex. 1008 ¶¶60–62, 101–02). “Passenger” commonly refers to all occupants of a vehicle, including the driver (*e.g.*, 5-passenger car). (Ex. 1008 ¶60). In the context of high occupancy vehicle (HOV) and toll lanes, the number of passengers is understood to include the driver. (Ex. 1008 ¶61). If “number of passengers” is considered to exclude the driver, it still inherently discloses “number of occupants” as the “number of passengers” plus one. (Ex. 1008 ¶62). Additionally, a person of ordinary skill in the art would have been motivated (and found it obvious) to use the “number of occupants” instead of “number of passengers” to extend the Hassett '183 system to cover not only toll roads, but occupancy-based toll roads, such as HOT or HOV lanes (which are indeed toll roads). (Ex. 1008 ¶¶101–02). If “passengers” and “occupants” are different, a person of ordinary skill in the art would have been motivated to use the

“number of occupants” in order to reduce confusion regarding whether or not the driver should be counted. (Ex. 1008 ¶¶101–02).

A person of ordinary skill in the art would have understood Hassett ’183 to disclose the claimed “as it traverses a designated section of highway” language. (Ex. 1008 ¶¶59, 68). Hassett ’183 discloses using the system on a highway, (Ex. 1004 at 3:39–42 (“multi-lane, divided highways”)), with transceivers placed at entry and exit points to create designated sections of the highway, (Ex. 1004 at 2:65–3:1). (Ex. 1008 ¶68).

- b. “a transmitter that transmits a claim as to the number of occupants in the vehicle;”

The vehicle transponder of Hassett ’183 includes both a “receiver and transmitter.” (Ex. 1004 at 2:38–41). Hassett ’183 discloses the driver enters information into the transponder via a keypad, such as the “number of passengers.” (Ex. 1004 at 5:28–32). In the next sentence, Hassett ’183 discloses that: “As the vehicle traverses the roadway 128, the roadway transceivers interrogate the vehicle transponder to retrieve *this information* [(the “number of passengers”)] for traffic analysis.” (Ex. 1004 at 5:32–34 (emphasis added)).

A person of ordinary skill in the art would have understood that the vehicle transponder of Hassett ’183 inherently “transmits” the claimed number of passengers for the roadway transceivers to “retrieve” it from the transponder. (Ex. 1008 ¶71–72).

As discussed in Part V.A.2.a Hassett '183's disclosure of "number of passengers" anticipates or renders obvious the "number of occupants."

- c. "a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;"

Hassett '183 discloses that vehicles "are each equipped with their own transponder" (the claimed "sending transponder"), which includes a transmitter. (Ex. 1004 at 2:38–41). Hassett '183 further discloses that these transponders are "located *in* host vehicles." (Ex. 1004 at 3:27–31 (emphasis added); *see also* Ex. 1004 at 7:25–29 ("for removable attachment to a dashboard surface or other convenient location within the vehicle")). Hassett '183 discloses the transponders transmit an "identifying signal for the transponder" to roadside receivers. (Ex. 1004 at 2:48–51). Hassett '183 further discloses that the vehicle transponder transmits a signal to roadside receivers that includes a "vehicle identification number." (Ex. 1004 at 10:31–36).

A person of ordinary skill in the art would have understood a transponder that transmits information to be a "sending transponder." (Ex. 1008 ¶74).

A person of ordinary skill in the art would have understood that an "identifying signal for the transponder" or "vehicle identification number" also "uniquely identifies the registrant with the program administrator." (Ex. 1008 ¶77–79). A vehicle identification number (VIN) is a term of art for a number that

uniquely identifies a vehicle, and is used when titling and registering a vehicle. (Ex. 1008 ¶78). As registered property, the vehicle's VIN also identifies the registrant of the vehicle. (Ex. 1008 ¶78). With Hassett '183's example of a VIN, a person of ordinary skill in the art would also understand the "identifying signal for the transponder" to be a unique identifier. (Ex. 1008 ¶77–79).

If the "code that uniquely identifies the registrant with the program administrator" is not considered to be explicitly or inherently disclosed by Hassett '183, it would have been obvious to a person of ordinary skill. (Ex. 1008 ¶79). A person of ordinary skill in the art would have considered it obvious that the registrant registers with the program administrator to obtain the transponder, as was typical with then-existing automatic tolling systems. (Ex. 1008 ¶¶79, 32, 34). It would have been obvious for the registrant to fill out a form identifying himself, with the program administrator requesting the registrant's VIN or noting the transponder's identification information, depending on which was to be used for the system. (Ex. 1008 ¶79). A person of ordinary skill in the art would have been motivated to associate the identification information with the registrant for administrative purposes, such as tracking charges or balances on a toll account or recovery of a transponder no longer being used. (Ex. 1008 ¶79). It would have been obvious to use a unique identifier for each registrant, to prevent confusing the records of one registrant with another. (Ex. 1008 ¶79). Then-existing automated

toll systems, such as the reflective identification tag disclosed in Hassett '183 (Ex. 1004), utilized unique identifiers for registrants to manage billing for toll services, thus it would have been obvious to do so with the system of Hassett '183. (Ex. 1008 ¶¶79, 32, 34).

The program administrator in Hassett '183 would have been inherent or obvious to a person of ordinary skill in the art, as someone would need to administer the placement of roadside monitoring equipment, the network management computer (discussed in the next element), as well as the distribution of transponders and collection of tolls. (Ex. 1008 ¶79). It would have been inherent or obvious for such a program administrator to have access to the collected data and to identify the registrants. (Ex. 1008 ¶79).

- d. “a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.”

Hassett '183 calls its “reading data collector” a “roadside transceiver” and the “central processing facility” a “network management computer” or “central data processor station.” (Ex. 1008 ¶¶81–82). Hassett '183 discloses that “the roadway transceivers interrogate the vehicle transponder” for information, including the “identifying signal” or “vehicle identification number” (the claimed “code”). (Ex. 1004 at 5:32–34, 2:48–51 (“identifying signal for the transponder . . . can be transmitted back to an interrogating roadside transceiver”), 10:31–36;

Ex. 1008 ¶81, 85). The Hassett '183 roadside transceivers “retrieve this information for traffic analysis.” (Ex. 1004 at 5:32–34; *see also* Ex. 1004 at 4:41–43 (“receive”)). Hassett '183's roadside transceivers have a limited range. (Ex. 1004 at 4:21–25 (“transponder . . . enters the radio field”)). The Hassett '183 roadside transceiver includes data storage in the form of a “memory element 206,” which may include “(RAM) 206a,” “(EPROM) 206b,” and “(EEPROM) 206c.” (Ex. 1004 at Fig. 2, 6:11–20, 3:17–19). Hassett '183 discloses that the roadside transceivers are “coupled to a central data processor station,” so they can “relay[] the information to the network management computer 128 for analysis.” (Ex. 1004 at 2:51–61, 5:16–21). Hassett '183 also discloses that “[s]ome of the collected information is processed by the transceivers.” (Ex. 1004 at Abstract). Hassett '183 uses a date and time stamp in communications between the roadside transceiver and the vehicle transponder. (Ex. 1004 at 8:1–4). Hassett '183 discloses providing this date and time information to the network management computer. (Ex. 1004 at 5:12–21). Thus, a time/date stamp would be provided as part of the communication from the vehicle transponder that communicates the vehicle identification number, both of which would then be forwarded to the network management computer together. (Ex. 1008 ¶82–86).

A person of ordinary skill in the art would have understood that the claimed “interrogate a vehicle” includes interrogating a transponder located in the vehicle,

as is disclosed in Hassett '183. (Ex. 1008 ¶81). A person of ordinary skill in the art would have further understood that the roadside transceiver of Hassett '183 has a range and can only interrogate a vehicle within its range (described as a “radio field” in Hassett '183). (Ex. 1008 ¶81, 87; Ex. 1004 at 4:21–25)

A person of ordinary skill in the art would have understood that after the roadside transceivers of Hassett '183 “received” the information (Ex. 1004 at 5:32–34, 4:41–43), they would transfer the information, including the “identifying signal” or “vehicle identification number” (the claimed “code identifying the registrant”), to the network management computer (the claimed “central processing facility”). (Ex. 1008 ¶82, 84–86; Ex. 1004 at Abstract (“Some of the collected information is processed by the transceivers and transponders, while other information is transmitted to the network management computer for processing.”)). A person of ordinary skill in the art would have understood the roadside transceiver of Hassett '183 to store the claimed “code” at least temporarily between its receipt and transfer to the network management computer (the claimed “central processing facility”). (Ex. 1008 ¶82). Furthermore, as the roadside transceivers can process some of the received information, the information must necessarily be stored in the transceiver during processing. (Ex. 1008 ¶83).

A person of ordinary skill in the art would have understood that the date and time stamps used in communication between the Hassett '183 vehicle transponder

and roadside transceivers would have been included in the information transmitted alongside the “identifying signal” or “vehicle identification number” (the claimed “code”) from the roadside transceivers to the network management computer (the claimed “central processing facility”) for analysis, such as calculating a vehicle’s speed. (Ex. 1008 ¶84; Ex. 1004 at 5:12–21 (relaying the “time and date information” from vehicle transponder to network management computer)). As both the claimed “code” and “time/date stamp” are being received from the vehicle transponder, stored by the roadside transceivers, and transferred to the network management computer, Hassett ’183 discloses they are “receive[d], store[d] and transfer[red] . . . along with” each other. (Ex. 1008 ¶82–86).

If not considered explicitly or inherently disclosed, a person of ordinary skill in the art would have considered it obvious to receive, store, and transfer the claimed “code” along with a “time/date stamp.” (Ex. 1008 ¶86). The vehicle transponder has information that Hassett ’183 is trying to transfer to the network management computer via the roadside transceivers. (Ex. 1008 ¶86). That information includes the claimed “time/date stamp,” and a person of ordinary skill in the art would have known and been motivated to add a “time/date stamp” to information being gathered for analysis as the time and day a vehicle is at certain locations would be beneficial to the analysis by the network management computer. (Ex. 1008 ¶86). A person of ordinary skill in the art would have found it



obvious to include the claimed “code” in the information passed along to the network management computer and would have been motivated to do so as it would enable more in-depth analysis of the traffic. (Ex. 1008 ¶¶84–86). Furthermore, time/date stamping of data is typical for a data collection system, such as the system described in Hassett ’183, which would be understood as obvious by a person of ordinary skill in the art. (Ex. 1008 ¶¶86).

3. Claim 3 is obvious in light of Hassett ’183

- a. “The vehicle occupancy monitoring system of claim 1 wherein the said sending transponder also transmits the claimed number of vehicle occupants.”

Hassett ’183 discloses using the same vehicle transponder to send both the unique code, as well as the number of passengers. (Ex. 1008 ¶¶88–89). The Hassett ’183 vehicle transponder transmits “[b]oth processed and unprocessed information, together with an identifying signal.” (Ex. 1004 at 2:48–51). Hassett ’183 discloses that the information transmitted by the vehicle transponder includes the “number of passengers.” (Ex. 1004 at 6:67–7:8). The “identifying signal” (or “vehicle identification number”) satisfies the “code” element, while the “number of passengers” satisfies the “number of occupants” element. (Ex. 1008 ¶¶89; *see also* Part V.A.2.a).

If Hassett ’183 is not considered to disclose using the same transponder to transmit both pieces of information, it would have been obvious to a person of

ordinary skill in the art, as data communications routinely use the same transponder to transmit different types of data. (Ex. 1008 ¶104–05). Additionally, a person of ordinary skill in the art would have been motivated to use a single transponder, as it would result in a physically smaller and less expensive unit. (Ex. 1008 ¶105).

4. Claim 6 is obvious in light of Hassett ’183

Claim 6 is substantially the same as Claim 1, but written in method form. (Ex. 1008 ¶47–48, 90). Thus claim 6 is invalid for substantially the same reasons as claim 1. (Ex. 1008 ¶90)

- a. “A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:”

As discussed in Part V.A.2.b, the Hassett ’183 vehicle transponder transmits vehicle occupancy data. (Ex. 1008 ¶92). The Hassett ’183 roadway transceivers “receive” the vehicle occupancy data. (Ex. 1008 ¶92; Ex. 1004 at 5:28–34 (occupancy data); 4:41–43 (“receive”)). As discussed in Part V.A.2.a, Hassett ’183 discloses the registrant (*e.g.*, driver) claiming the number of passengers (the claimed “occupancy”) through a keypad input on the transponder. (Ex. 1008 ¶92).

As discussed in Part V.A.2.c, the vehicle transponder of Hassett ’183 transmits—and the roadside transceivers receive—an identifying signal (or vehicle

identification number) for the transponder, hence identifying the registrant. (Ex. 1008 ¶93).

As discussed in Part V.A.2.a, this is all done as the vehicle discussed in Hassett '183 traverses a designated section of a roadway (*e.g.*, a toll road or highway). (Ex. 1008 ¶94).

- b. “transmitting the number of occupants in a vehicle claimed by a registrant;”

As discussed in Part V.A.2.b, the vehicle transponder of Hassett '183 transmits the number of passengers (the claimed “vehicle occupancy data”). (Ex. 1008 ¶95). As discussed in Part V.A.2.a, Hassett '183 discloses the registrant (*e.g.*, driver) claiming the number of passengers through a keypad input on the transponder. (Ex. 1008 ¶95). As discussed in Part V.A.2.a Hassett '183's disclosure of “number of passengers” anticipates or renders obvious the “number of occupants.”

- c. “transmitting a signal from the vehicle that identifies the registrant;”

As discussed in Part V.A.2.c, the vehicle transponder of Hassett '183 transmits an “identifying signal” (or “vehicle identification number”) for the transponder, hence identifying the registrant. (Ex. 1008 ¶96; Ex. 1004 at 2:48–51).

- d. “and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway.”

As discussed in Part V.A.2.b, the Hassett ’183 roadside transceivers receive the number of passengers (the claimed “number of occupants”) “claimed” by the driver (the claimed “registrant”). (Ex. 1008 ¶97). As discussed in Part V.A.2.c, the Hassett ’183 roadside transceivers read the “identifying signal” for the transponder (or “vehicle identification number”), hence identifying the registrant. (Ex. 1008 ¶¶97, 77–79). As discussed in Part V.A.2.a, this is all done as the vehicle of Hassett ’183 traverses a designated section of a roadway (*e.g.*, a toll road or highway). (Ex. 1008 ¶98).

5. Claim 8 is obvious in light of Hassett ’183

- a. “The method of claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.”

As discussed in Part V.A.3.a, the Hassett ’183 vehicle transponder transmits both the “identifying signal” (or “vehicle identification number”), as well as the “claimed” “number of passengers” (claimed “number of occupants”). (Ex. 1008 ¶99). A person of ordinary skill in the art would have understood the Hassett ’183 disclosure to inherently require the two pieces of data to be transmitted via Hassett

'183's disclosed RF (radio frequency) signals. (Ex. 1008 ¶¶99; *e.g.*, Ex. 1004 at 2:32–41).

As described in the '101 patent specification, the RF signal is “emit[ted] either continuously or intermittently.” (Ex. 1001 at 3:13–15). Consistent with the '101 patent specification and a broadest reasonable interpretation, Hassett '183 discloses transmitting a signal “both identifying the registrant and the number of occupants claimed by that registrant,” whether as one continuous or an intermittent signal. (Ex. 1008 ¶¶99).

If Hassett '183 is not considered to disclose “transmit[ting] a signal both identifying the registrant and the number of occupants claimed by that registrant,” it would have been obvious to a person of ordinary skill in the art, as data communications routinely use the same transponder signal to transmit different types of data. (Ex. 1008 ¶¶100, 106–07). Additionally, a person of ordinary skill in the art would have been motivated to use the same transponder signal, as it would result in a physically smaller and less expensive unit. (Ex. 1008 ¶¶106–07).

**B. [Ground 2] – Anticipation by Hassett '183**

Hassett '183 anticipates claims 1, 3, 6, and 8 of the '101 patent. (Ex. 1008 ¶41).

Petitioner has addressed the disclosures of Hassett '183 that correspond to the claim language of the Challenged Claims. *See supra* Part V.A. These

disclosures anticipate each of the limitations of the Challenged Claims. (Ex. 1008 ¶¶57–100). To the extent the Board finds any of these limitations not to be explicitly disclosed, they are inherently disclosed. (Ex. 1008 ¶¶57–100)

If Hassett '183's disclosure of "number of passengers" is not considered an explicit disclosure of the claimed "number of occupants," it would be an inherent disclosure. (Ex. 1008 ¶62). Namely, if the "number of passengers" excludes the driver, then disclosure of the "number of passengers" inherently discloses the "number of occupants," as the number of occupants equals the number of passengers plus one (the driver). (Ex. 1008 ¶62).

Hassett '183 sometimes discloses communications between the vehicle transponder and the roadside transceivers, by specifying that one "transmits" to the other without explicitly disclosing the "receiving," or that one "receives" from the other without explicitly disclosing the "transmitting." (*E.g.*, Ex. 1004 at 2:65–3:1). A person of ordinary skill in the art would have understood that Hassett '183's disclosure of such communications inherently discloses "transmitting" and "receiving." (Ex. 1008 ¶72).

If Hassett '183 is not considered to explicitly disclose the transponder transmitting "a code that uniquely identifies the registrant with the program administrator," it is inherent in the disclosures of Hassett '183. Hassett '183 is disclosed as part of a toll system. (Ex. 1008 ¶¶77–79; *e.g.*, Ex. 1004 at 1:33–36,

3:1–3). Hassett ’183 is further disclosed as being an improvement on the merely “reflective vehicle identification tag” systems (Ex. 1004 at 1:57–2:13), which at the time of Hassett ’183 collected the identification information to automate toll payments. (Ex. 1008 ¶79). The program administrator for the toll authority would use the identification information to identify the registrant and either debit the registrant’s account or sending the registrant a bill. (Ex. 1008 ¶79).

If Hassett ’183 is not considered to explicitly disclose the “store . . . said transmitted code . . . along with a time/date stamp,” it is inherent in the disclosures of Hassett ’183. As discussed in Part V.A.2.d, Hassett ’183 explicitly discloses the receiving and transferring of the claimed “code” and “time/date stamp.” In order for the roadside monitoring equipment to receive and then transfer the data, it must necessarily store the data, at least temporarily, in order to buffer and relay the data. (Ex. 1008 ¶82).

If Hassett ’183 is not considered to explicitly disclose “said sending transponder also transmits the claimed number of vehicle occupants” of claim 3 explicitly, it is inherent in the disclosures of Hassett ’183. Hassett ’183 discloses only a single vehicle transponder per vehicle. (Ex. 1008 ¶¶89, 99). Thus all transmission between the vehicle and the roadside transceivers would necessarily involve the sole disclosed vehicle transponder per vehicle. (Ex. 1008 ¶¶89, 99).

### **C. [Ground 3] – Obviousness in Light of the Ontario Report**

The Ontario Report renders claims 1, 3, 5, 6, 8, and 10 of the '101 patent obvious. (Ex. 1008 ¶42).

#### **1. Overview of the Ontario Report**

The Ontario Report is 102(a) prior art to the '101 patent. The Ontario Report was published on December 16, 2004, approximately three months before the '101 patent was filed. (Ex. 1007). The Ontario Report itself shows a publication date of December 16, 2004. (Ex. 1005 at letter on second page). The declaration of Anthony Wing demonstrates that the Ontario Report is a business record and meets the business records exception for hearsay as to its claimed publication date of December 16, 2004. (Ex. 1007; FED. R. EVID. 803(6)).

The Ontario Report was prepared by McCormick Rankin Corporation. (Ex. 1005 at Cover). It analyzes the viability of an automated vehicle occupancy monitoring system. (Ex. 1005 at i). The Ontario Report discloses an “[a]utomated system to detect the number of people in a vehicle,” as well as an “[a]utomated system to communicate that information to enforcement authority.” (Ex. 1005 at 3). The Ontario Report discloses numerous in-vehicle systems capable of automatically detecting the number of people in the vehicle (Ex. 1005 at 12–19), as well as an interim “self-identifying” method where a user inputs the number of occupants (Ex. 1005 at 85, 92). The Ontario Report discloses automatically



communicating the occupancy information using a “windshield-mounted transponder” and a roadside “reader,” such as a gantry located over a particular lane of traffic. (Ex. 1005 at 19). The Ontario Report further discloses displaying the occupant information to police, such as using different colored lights mounted to the windshield (“green for two occupants, blue for three”), or providing police with a handheld or in-vehicle device. (Ex. 1005 at 41–42).

2. Claim 1 is obvious in light of the Ontario Report
  - a. “A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway:”

The Ontario Report discloses a “vehicle occupancy monitoring system,” and is entitled “Automated Vehicle Occupancy Monitoring Systems for HOV / HOT Facilities.” (Ex. 1005 at Cover). A discussion of vehicle occupancy monitoring systems can be found throughout the Ontario Report. (Ex. 1008 ¶110). The Ontario Report discloses the use of both automated and manual systems for detecting, and thus claiming, the number of occupants in a vehicle. (Ex. 1005 at 12–19 (discussing various automatic detection systems), 94 (“self identifying transponder into which the motorist keys the number of occupants in the vehicle”), 101 (“self-identifying transponder that is user programmed with number of passengers”). The Ontario Report discloses use of the system along tolled highways or for HOV lanes. (Ex. 1005 at 19).

A person of ordinary skill in the art would have understood that the number of occupants determined by the Ontario Report’s automatic detection or the manual self-identification would each meet the “claim [] made by a registrant about the number of occupants in a vehicle” language. (Ex. 1008 ¶¶110–13).

A person of ordinary skill in the art would have understood the disclosure of the system on tolled highways to cover vehicles traversing a “designated section of highway,” namely a section of highway where the roadside monitoring equipment is in place. (Ex. 1008 ¶114).

- b. “a transmitter that transmits a claim as to the number of occupants in the vehicle;”

The Ontario Report discloses a system that has two elements: (1) “Automated system to detect the number of people in a vehicle while using a HOV / HOT facility” and (2) “Automated system to communicate that information to enforcement authority.” (Ex. 1005 at 3). The Ontario Report discloses using “in-vehicle systems for occupancy detection, combined with various methods of processing and transmitting that information.” (Ex. 1005 at 11; *see also* Ex. 1005 at 19 (“Once the number of vehicle occupants has been identified . . . transmit that

information . . . .”). The Ontario Report discloses a “windshield-mounted transponder” as the claimed “transmitter.” (Ex. 1005 at 19).<sup>2</sup>

A person of ordinary skill in the art would have understood the Ontario Report to disclose the transmission of “a claim as to the number of occupants in the vehicle” (either automatically detected or manually entered) among the information transmitted from the windshield-mounted transponder. (Ex. 1008 ¶¶116–17; Ex. 1005 at 11, 19).

- c. “a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;”

The “windshield-mounted transponder” of the Ontario Report is the claimed “sending responder.” The Ontario Report discloses the use of a “windshield-mounted transponder,” which was already in use for electronic tollways. (Ex. 1005 at 19). These windshield-mounted transponders are “in-vehicle transponders.” (Ex. 1005 at 55). The Ontario Report discloses reading this transponder’s “identification (account) number” by gantry-mounted antennas (*i.e.*, roadside monitoring equipment). (Ex. 1005 at 19). The Ontario Report further discloses use of “unique” identifications. (Ex. ONT at 43 (“unique electronic ID tag”). The system uses the transponder information to either send a bill in the mail or deduct

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<sup>2</sup> The Ontario Report sometimes also uses other terms, such as “vehicle tag.” (*E.g.*, Ex. 1005 at 43).

the toll from a pre-authorized account. (Ex. 1005 at 19). Hassett '183 discloses that program administrators would be necessary to run the system, and could identify the registrants using the system. (Ex. ONT at 56 (automated system would require “administrative staff”), 60 (“administrative work” would involve “following up on unpaid fines”)).

A person of ordinary skill in the art would have understood the “windshield-mounted transponder” to be “a sending transponder,” as the disclosed transponder transmits (*i.e.*, “sends”) information to the roadside monitoring equipment. (Ex. 1008 ¶119). A person of ordinary skill in the art would have understood the windshield-mounted transponder inherently must transmit the identification number in order for the identification number to be read by the gantry-mounted antennas. (Ex. 1008 ¶120).

A person of ordinary skill in the art would have understood the transponder’s identification number to be a “code that uniquely identifies the registrant with the program administrator.” (Ex. 1008 ¶121–22). As the Ontario Report calls it an “account” number, a person of ordinary skill in the art would have understood that to identify the registrant through the registrant’s account with the program administrator. (Ex. 1008 ¶¶121–22). Additionally, it is inherently necessary that the “identification (account) number” identify the registrant to the program administrator in order for the automatic toll collection system to deduct

the toll from the correct pre-authorized account, or to mail the bill to the correct registrant. (Ex. 1008 ¶¶121–22). In order for a program administrator to follow up on unpaid fines, the system must inherently identify the registrants to the program administrator. (Ex. 1008 ¶¶121–22).

If the Ontario Report is not considered to disclose a “code that uniquely identifies the registrant with the program administrator,” it would have been obvious to a person of ordinary skill in the art. The Ontario Report discloses billing “pre-authorized accounts” or mailing a toll charge. (Ex. 1005 at 19). The Ontario Report discloses that users would “register” to use the system in HOV lanes. (Ex. 1005 at 40). It would have been obvious to a person of ordinary skill in the art to associate the identification number with the user who registered for the transponder (the claimed “registrant”), in order to identify the registrant to the program administrator. (Ex. 1008 ¶¶149–50). A person of ordinary skill in the art would be motivated to associate the identification number with the registrant to enable the billing of the pre-authorized accounts, or to know where to mail the toll charges. (Ex. 1008 ¶¶149–50).

- d. “a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.”

The Ontario Report uses “roadside monitoring equipment,” (Ex. 1005 at 38), such as “roadside antennas,” (Ex. 1005 at 43), as the claimed “reading data

collectors.” (Ex. 1008 ¶124). The roadside monitoring equipment “interrogate[s]” the windshield-mounted transponder of the Ontario Report’s occupancy monitoring system (OMS). (Ex. 1005 at 40, 43, 55 (“interrogate”)). The Ontario Report discloses that the roadside monitoring equipment reads the “identification (account) number” (the claimed “transmitted code”) from the vehicle’s transponder. (Ex. 1005 at 19). The Ontario Report further discloses that the roadside monitoring equipment has only a limited range. (Ex. 1005 at 56 (“range of less than 25m”)).

A person of ordinary skill in the art would have understood the interrogation of the windshield-mounted transponder within the vehicle to disclose interrogation of the vehicle. (Ex. 1008 ¶125). A person of ordinary skill in the art would have understood that the interrogation was not of the entire vehicle, but of a particular sub-system of the vehicle, namely the windshield-mounted transponder. (Ex. 1008 ¶125).

A person of ordinary skill in the art would have understood that the limited range of the roadside monitoring equipment inherently means it could only interrogate vehicles “within its range.” (Ex. 1008 ¶126).

A person of ordinary skill in the art would have understood that when the roadside monitoring equipment reads the identification number, it “receive[s]” the claimed “code.” (Ex. 1008 ¶127).

The Ontario Report discloses that the occupancy monitoring system “will need back office and field software systems,” such as a “host computer” located in “a police office or a traffic management centre.” (Ex. 1005 at 56). The Ontario Report also discloses the system requires “communication linkages,” (Ex. 1005 at 56) and transmits the information from vehicle transponders to a “processing centre,” (Ex. 1005 at 43). A person of ordinary skill in the art would have understood the disclosure of “communication linkages” with a “host computer” to disclose that the roadside monitoring equipment transfers the transmitted identifying code to a central processing facility—or have found it an obvious modification. (Ex. 1008 ¶¶128, 153). A person of ordinary skill in the art also would have understood this receiving and transferring of the claimed “code” to require the roadside monitoring equipment store the transmitted identifying code, at least temporarily, before transferring it to the central processing facility. (Ex. 1008 ¶128).

The Ontario Report discloses recording the time at which events happen, such as entry to a toll road. (Ex. 1005 at 19). At entry to a toll road, the time and place are written to memory in the vehicle’s transponder. (Ex. 1005 at 19 (“writes the time and place of system entry to the transponder’s simple 256 bit memory”)). That information is read back out from the vehicle’s transponder when exiting the toll road. (Ex. 1005 at 19). The Ontario Report discloses using this time

information in calculating and preparing tolls or bills, such as preparing “detailed invoices [] noting times, dates” to mail to the vehicle owner. (Ex. 1005 at 19, 31). The Ontario Report further discloses using time-stamped evidence, such as a photograph, when there is a violation (such as improper use of an HOV lane). (Ex. 1005 at 22). A person of ordinary skill in the art would have understood the Ontario Report to disclose the receiving, storing, and transmitting of a date/time stamp from the vehicle transponder to the roadside monitoring equipment and then forwarded to the central processing facility along with the identifying code. (Ex. 1008 ¶127–29).

If not considered to be disclosed by the Ontario Report, a person of ordinary skill in the art would have been motivated to add the claimed “time/date stamp” to the Ontario Report in order to provide the information necessary for the “detailed invoices.” (Ex. 1008 ¶¶151–53). A person of ordinary skill in the art would also be motivated to add the claimed “time/date stamp” to allow for a more complete analysis of the toll or HOV/HOT system. (Ex. 1008 ¶151; Ex. 1005 at 61 (discussing operational monitoring)).



3. Claim 3 is obvious in light of the Ontario Report
  - a. “The vehicle occupancy monitoring system of claim 1 wherein the said sending transponder also transmits the claimed number of vehicle occupants.”

The Ontario Report discloses transmitting both vehicle occupancy information, as well as a vehicle identifier, via the windshield-mounted transponder (also called a vehicle tag). (Ex. 1005 at 19–20 (“The same approach could apply in monitoring an HOV lane, except with vehicle occupancy information embedded in the transponder’s data packet. Transponders can be ‘dumb’ and simply have vehicle identification embedded in them, or they can host varying degrees of ‘smart’ features.”), 43 (“It would be a short step technologically to add occupancy information to the vehicle ‘tag’ . . . .”), 55 (collect “seat gauge results” (occupancy) and tie it to a “vehicle identification number” “for interrogation by a roadside antenna”)). The Ontario Report does not disclose separate transponders for transmitting the claimed number of occupants and the identification number, but only one transponder for both, thus a person of ordinary skill in the art would have understood the single “sending transponder” to transmit both pieces of data. (Ex. 1008 ¶130).

If the Ontario Report is not considered to disclose using the same transponder to transmit both pieces of information, it would have been obvious to a person of ordinary skill in the art, as data communications routinely use the same

transponder to transmit different types of data. (Ex. 1008 ¶154). Additionally, a person of ordinary skill in the art would have been motivated to use a single transponder, as it would result in a physically smaller and less expensive unit. (Ex. 1008 ¶155).

4. Claim 5 is obvious in light of the Ontario Report
  - a. “The vehicle occupancy monitoring system of claim 3 further comprising: a visual display of the number of claimed occupants that can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

The Ontario Report discloses visually displaying the number of claimed occupants in a way that can be seen by an enforcement officer outside the vehicle as it traverses the highway. (Ex. 1008 ¶132). The Ontario Report discloses that the system could mount lights on the windshield of the vehicle to show the number of occupants for visual monitoring and enforcement by police. (Ex. 1005 at 41 (“green for two occupants, blue for three”). “A more advanced system could provide the police [(i.e., enforcement officer)] with a handheld or in-vehicle readout of occupancy generated as HOV lane users cross an upstream monitoring station” (i.e., as the vehicle “traverses the highway”). (Ex 1005 at 42). A person of ordinary skill in the art would have understood the Ontario Report to disclose this element. (Ex. 1008 ¶¶131–33).

5. Claim 6 is obvious in light of the Ontario Report

Claim 6 is substantially the same as Claim 1, but written in method form.

(Ex. 1008 ¶¶47–48).

- a. “A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:”

As discussed in Part V.C.2.b, the windshield-mounted transponder of the Ontario Report transmits the vehicle occupancy data that was claimed (either automatically or manually) by the registrant. The roadside monitoring equipment of the Ontario Report receives the vehicle occupancy data. (Ex. 1008 ¶¶136; Ex. 1005 at 19 (“Once the number of vehicle occupants has been identified . . . transmit that information from the car to the HOV lane monitoring system / service.”)). As discussed in Part V.C.2.a, the Ontario Report discloses automatically detecting the number of occupants to claim, or alternatively allowing the “motorist” or “user” (the claimed “registrant”) to “claim” the number of passengers by programming or keying it into the windshield-mounted transponder. (Ex. 1005 at 85, 92).

As discussed in Part V.C.2.c, the windshield-mounted transponder of the Ontario Reference transmits—and the roadside monitoring equipment receives—an identification number for the transponder, hence “identifying the registrant.”

As discussed in Part V.C.2.a, this is all done as the vehicle discussed in the Ontario Report “traverses a designated section of highway” (such as a toll road or HOV lane with roadside monitoring equipment).

- b. “transmitting the number of occupants in a vehicle claimed by a registrant;”

As discussed in Part V.C.2.b, the vehicle transponder of the Ontario Reference transmits the number of occupants in a vehicle. As discussed in Part V.C.2.a, the Ontario Report discloses the “registrant” (*e.g.*, user) “claiming” the number of occupants through a keypad input on the transponder or automatically detecting the number of occupants.

- c. “transmitting a signal from the vehicle that identifies the registrant;”

As discussed in Part V.C.2.c, the windshield-mounted transponder of the Ontario Report transmits a signal (*e.g.*, identification number) from the vehicle (*e.g.*, windshield-mounted transponder), that “identifies the registrant.”

- d. “and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway.”

As discussed in Part V.C.2.b, the roadside monitoring equipment of the Ontario Report receives the transmission including the claimed number of occupants. As discussed in Part V.C.2.c, the roadside monitoring equipment of the Ontario Report reads the identification number from the transponder, which

“identifies the registrant.” As discussed in Part V.C.2.a, this is all done as the vehicle of the Ontario Report “transits the designated section of highway” (such as a toll road or HOV lane with roadside monitoring equipment).

6. Claim 8 is obvious in light of the Ontario Report
  - a. “The method of claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.”

As discussed in Part V.C.3.a, the windshield-mounted transponder of the Ontario Report transmits a signal carrying both the identification number as well as the claimed number of occupants, or it would have been obvious to a person of ordinary skill in the art. Furthermore, the Ontario Report discloses sending the occupancy information in the same data packet from the transponder that carries the identification number. (Ex. 1005 at 19 (“The same approach could apply in monitoring an HOV lane, except with vehicle occupancy information embedded in the transponder’s data packet.”)).

As described in the ’101 patent specification, the RF signal is “emit[ted] either continuously or intermittently.” (Ex. 1001 at 3:13–15). Consistent with the ’101 patent specification and a broadest reasonable interpretation, the Ontario Report discloses transmitting a signal “both identifying the registrant and the

number of occupants claimed by that registrant,” whether as one continuous or an intermittent signal. (Ex. 1008 ¶145).

If the Ontario Report is not considered to disclose “transmit[ing] a signal both identifying the registrant and the number of occupants claimed by that registrant,” it would have been obvious to a person of ordinary skill in the art, as data communications routinely use the same transponder signal to transmit different types of data. (Ex. 1008 ¶¶156–57). Additionally, a person of ordinary skill in the art would have been motivated to use the same transponder signal, as it would result in a physically smaller and less expensive unit. (Ex. 1008 ¶157).

7. Claim 10 is obvious in light of the Ontario Report

- a. “The method of claim 8 further comprising a visual display of the claimed number of occupants, which display can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

As discussed in Part V.C.4.a, the Ontario Report discloses using color coded windshield-mounted lights to visually display the number of occupants or transmitting the information to a handheld or in-vehicle display for use by police.

**D. [Ground 4] – Anticipation by the Ontario Report**

The Ontario Report anticipates claims 1, 3, 5, 6, 8, and 10 of the ’101 patent. (Ex. 1008 ¶42).

Petitioner has addressed the disclosures of the Ontario Report that correspond to the claim language of the Challenged Claims. *See supra* Part V.C.

These disclosures anticipate each of the limitations of the Challenged Claims. (Ex. 1008 ¶¶108–47). To the extent the Board finds any of these limitations not to be explicitly disclosed, they are inherently disclosed. (Ex. 1008 ¶¶108–47).

The Ontario Report discloses communications between the windshield-mounted transponder and the roadside monitoring equipment, by specifying that one “transmits” to the other, or that one “receives” from the other. (*E.g.*, Ex. 1005 at 19 (section 2.3.3)). A person of ordinary skill in the art would have understood that the Ontario Report’s disclosure of each such communications inherently discloses both “transmitting” and “receiving.” (Ex. 1008 ¶¶120).

**E. [Ground 5] – Obviousness in Light of Hassett ’183 and the Ontario Report**

The combination of Hassett ’183 and the Ontario Report renders claims 1, 3, 5, 6, 8, and 10 of the ’101 patent obvious. (Ex. 1008 ¶43).

1. Overview of Hassett ’183 and the Ontario Report

Hassett ’183 and the Ontario Report have each been individually discussed in Parts V.A and V.C, respectively.

A person of ordinary skill in the art would have considered it obvious to combine Hassett ’183 and the Ontario Report into a system that practices the claims of the ’101 patent. (Ex. 1008 ¶159). Both Hassett ’183 and the Ontario Report are directed towards electronic monitoring of restricted-use roadways, such as toll roads or HOV lanes. (Ex. 1004 at 1:33–36; Ex. 1005 at i). Both systems use

in-vehicle transponders in communication with roadside equipment. (Ex. 1004 at Abstract (discussing the transponders and transceivers); Ex. 1005 at i (discussing transponders and roadside readers)). Both systems also transmit the collected information to a central processing facility for analysis. (Ex. 1004 at 2:51–56; Ex. 1005 at 43 (“processing centre” or “host computer”). While Hassett ’183 does not disclose a visual display for use in enforcement, the Ontario Report does. (Ex. 1005 at 41–42 (different colored lights or a handheld or in-vehicle display)).

A person of ordinary skill in the art would have been motivated to combine Hassett ’183 and the Ontario Reference as they are both in the same field. (Ex. 1008 ¶159). They both disclose automation of a toll collection system, including the collection of vehicle identification and occupancy data. (Ex. 1008 ¶159). A person of ordinary skill in the art would have been motivated to combine the references due to add Ontario Report’s more extensive discussion of HOV/HOT lanes and the Ontario Report’s visual display for enforcement to Hassett ’183. (Ex. 1008 ¶159).

2. Claim 1 is obvious in light of Hassett ’183 and the Ontario Report

As discussed in Parts V.A.2 and V.C.2, Hassett ’183 and the Ontario Report each disclose the elements of this claim. To the extent that any of these claim elements are not found to be explicitly or inherently disclosed by one or the other,



the combination of Hassett '183 and the Ontario Report would render the claim obvious. (Ex. 1008 ¶¶160–61).

If the claimed “number of occupants” is not considered anticipated or obvious in light of Hassett '183, a person of ordinary skill in the art would have understood to use the disclosed “number of occupants” from the Ontario Report in the combined system, and would have been motivated to do so to reduce the confusion of whether or not the driver is included in the count. (Ex. 1008 ¶161).

If the claimed “program administrator” is not considered anticipated or obvious in light of Hassett '183, a person of ordinary skill in the art would have understood to include the disclosed “administrative staff” of the Ontario Report, or their employer, as program administrators. (Ex. 1005 at 56; Ex. 1008 ¶122). As discussed in Part V.C.2.c, the program administrators of the Ontario Report’s system are able to use the claimed “code” to identify the registrant in order to properly bill the individual. (Ex. 1005 at 19).

If the claimed “time/date stamp” is not considered anticipated or obvious in light of Hassett '183, a person of ordinary skill in the art would have found it obvious to include in the combined system, and motivated to do so in order to provide the “detailed invoices” suggested by the Ontario Report, including times and dates of toll fees. (Ex. 1005 at 31; Ex. 1008 ¶151).

3. Claim 3 is obvious in light of Hassett '183 and the Ontario Report

As discussed in Parts V.A.3 and V.C.3, Hassett '183 and the Ontario Report each disclose this claim or render it obvious. To the extent that any of these claim elements are not found to be explicitly or inherently disclosed by one or the other, the combination of Hassett '183 and the Ontario Report would render the claim obvious. (Ex. 1008 ¶166).

4. Claim 5 is obvious in light of Hassett '183 and the Ontario Report

- a. “The vehicle occupancy monitoring system of claim 3 further comprising: a visual display of the number of claimed occupants that can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

A person of ordinary skill in the art would have found it obvious to add the external visual display of the Ontario Report to Hassett '183 for enforcement of the toll roads or HOV lanes. (Ex. 1008 ¶169). As discussed in Part V.A.2.b, the Hassett '183 system already collects and transmits information regarding the number of occupants in a vehicle. Thus it would be obvious to use Hassett '183 for HOV lanes. (Ex. 1008 ¶169). It would have been obvious to add the windshield-mounted lights, handheld display, or in-vehicle display of the Ontario Report to Hassett '183 and use it to indicate the “number of occupants” already being transmitted by Hassett '183. (Ex. 1008 ¶169). This combination of Hassett '183 and the Ontario Report requires no changes to Hassett '183 other than the addition

of the windshield-mounted lights, handheld display, or in-vehicle display for inspection by an enforcement officer. (Ex. 1008 ¶170).

A person of ordinary skill in the art would be motivated to add the visual display element of the Ontario Report to Hassett '183 in order to provide an enforcement mechanism for Hassett '183. (Ex. 1008 ¶169).

5. Claim 6 is obvious in light of Hassett '183 and the Ontario Report

Claim 6 is substantially the same as Claim 1, but written in method form, and is thus obvious for similar reasons. (Ex. 1008 ¶47–48).

As discussed in Parts V.A.4 and V.C.5, Hassett '183 and the Ontario Report each disclose the elements of this claim. To the extent that any of these claim elements are not found to be explicitly or inherently disclosed by one or the other, the combination of Hassett '183 and the Ontario Report would render the claim obvious. (Ex. 1008 ¶171).

As discussed in Part V.E.2, if the claimed “number of occupants,” “program administrator,” or “time/date stamp” elements are not considered anticipated or obvious in light of Hassett '183, it would have been obvious to include those elements as disclosed in the Ontario Report to render claim 6 obvious.

6. Claim 8 is obvious in light of Hassett '183 and the Ontario Report

As discussed in Parts V.A.5 and V.C.6, Hassett '183 and the Ontario Report each disclose this claim or render it obvious. To the extent that any of these claim elements are not found to be explicitly or inherently disclosed by one or the other, the combination of Hassett '183 and the Ontario Report would render the claim obvious. (Ex. 1008 ¶175).

7. Claim 10 is obvious in light of Hassett '183 and the Ontario Report

- a. “The method of claim 8 further comprising a visual display of the claimed number of occupants, which display can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

As discussed in Part V.E.4.a, it would have been obvious for a person of ordinary skill in the art to combine Hassett '183 and the Ontario Report, thus rendering this claim obvious. A person of ordinary skill in the art would have combined the Ontario Report disclosure of color coded windshield-mounted lights, handheld displays, or in-vehicle displays with Hassett '183 (along with any other needed disclosures of the Ontario Report) in a manner that would have practiced this claim language. (Ex. 1008 ¶176).

A person of ordinary skill in the art would be motivated to add the visual display element of the Ontario Report to Hassett '183 in order to provide an enforcement mechanism for Hassett '183. (Ex. 1008 ¶176).

**F. [Ground 6] – Obviousness in Light of Hassett ’183 and Hassett ’389**

The combination of Hassett ’183 and Hassett ’389 renders claims 1, 3, 5, 6, 8, and 10 of the ’101 patent obvious. (Ex. 1008 ¶44).

1. Overview of Hassett ’183 and Hassett ’389

Hassett ’183 has already been discussed in Part V.A.

Hassett ’389 shares the same first named inventor as Hassett ’183 (John J. Hassett). Hassett ’389 has one other non-shared inventor, while Hassett ’183 has two other non-shared inventors.

Hassett ’389 is 102(b) prior art to the ’101 patent. Hassett ’389 was filed on May 17, 1990 and issued on February 4, 1992, over 13 years before the ’101 patent was filed.

Hassett ’389 discloses a system for automatic collection of tolls. (Ex. 1006 at Title (“Automatic Toll Processing Apparatus”), Abstract). Hassett ’389 discloses using an “in-vehicle component (IVC),” with a transponder, in communication with “transmitters” and “receivers” at toll collection facilities (Ex. 1006 at Fig. 1, 4:13–24, 5:19–31). Hassett ’389 discloses reporting the data collected at the toll collection facilities to a centralized “Toll Transaction Management (TTM) subsystem.” (Ex. 1006 at 16:22–27). While Hassett ’389 does not enforce tolls based on the number of occupants in a vehicle, it does enforce tolls based on the “vehicle class.” (Ex. 1006 at 13:22–27). Hassett ’389 discloses using a light

column that illuminates a different indicator light based on the vehicle class claimed by the IVC. (Ex. 1006 at 13:29–35).

A person of ordinary skill in the art would have been motivated to combine Hassett '183 and Hassett '389 in a way that practices the claims of the '101 patent. (Ex. 1008 ¶¶177–80). Hassett '183 and Hassett '389 are both in the same field. (Ex. 1008 ¶178). Both Hassett '183 and Hassett '389 are directed towards electronic monitoring of toll roads. (Ex. 1004 at 1:33–36; 1006 at 2:17–20). Both systems use in-vehicle transponders in communication with roadside equipment to collect vehicle identification and other vehicle data. (Ex. 1004 at Abstract; Ex. 1006 at Fig. 1, 4:13–24, 5:19–31). Both systems also transmit the collected information to a central processing facility. (Ex. 1004 at 2:51–56; Ex. 1006 at 16:22–27).

Furthermore, Hassett '183 explicitly references Hassett '389 as having related subject matter and incorporates Hassett '389 by reference. (Ex. 1004 at 1:6–14 (“The subject matter of this application is related to that disclosed in U.S. Pat. No. 5,086,389 . . . .” “The above cited patent and patent application are assigned to the assignee of the present application, and are incorporated herein by reference.”)). Thus a person of ordinary skill in the art would have been explicitly motivated by the disclosure of Hassett '183 to combine Hassett '183 and Hassett '389.

A person of ordinary skill in the art would also have been motivated to modify the vehicle class display of Hassett '389 for use in the system of Hassett '183 so as to provide an enforcement mechanism for vehicle occupancy regulations in HOV lanes or occupancy-based toll roads. (Ex. 1008 ¶212). Such a combination would be no more than combining known elements to achieve predictable results. (Ex. 1008 ¶215).

2. Claim 1 is obvious in light of Hassett '183 and Hassett '389
  - a. “A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway:”

As discussed in Part V.A.2.a, Hassett '183 discloses this preamble.

While Hassett '389 does not disclose monitoring occupancy, Hassett '389 does disclose monitoring a comparable attribute, “vehicle class.” (Ex. 1008 ¶182). Hassett '183 discloses that “vehicle class” is a parameter that may be collected by its system in addition to the “number of passengers.” (Ex. 1004 at Abstract). Thus a person of ordinary skill in the art would have found it obvious for the combination of these two references to monitor occupancy, as well as vehicle class. (Ex. 1008 ¶183).

Hassett '389 further discloses that the registrant may disclose an incorrect vehicle class, such as using an automobile transponder in a truck, thereby avoiding

or reducing a toll. (Ex. 1006 at 13:21–27). Thus, Hassett '389 discloses it is the registrant “claiming” the vehicle class. (Ex. 1008 ¶182).

Hassett '389 discloses the various communications occur at entry point and exit points of a toll highway. (Ex. 1006 at 6:22–23). A person of ordinary skill in the art would have understood that these communications occur as a vehicle “traverses a designated section of highway.” (Ex. 1008 ¶182).

- b. “a transmitter that transmits a claim as to the number of occupants in the vehicle;”

As discussed in Part V.A.2.b, Hassett '183 discloses this element.

Hassett '389 discloses an IVC as the claimed transmitter. (Ex. 1008 ¶186). The IVC includes an RF transmitter. (Ex. 1006 at Fig. 3, 7:25–33). The IVC transmits a signal including a message about the claimed vehicle class. (Ex. 1006 at 8:26–30). A person of ordinary skill in the art would have found it obvious for the combination of Hassett '389 and Hassett '183 to include a message about the number of occupants in the signal instead of, or in addition to, the message about claimed vehicle class, so it could be used in conjunction with toll roads with HOV/HOT lanes, especially since Hassett '183 alone already discloses transmitting both the number of occupants and vehicle class. (Ex. 1008 ¶187).

- c. “a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;”

As discussed in Part V.A.2.c, Hassett '183 discloses this element.



Hassett '389 discloses a transponder in the IVC (the RF transmitter and receiver) as the claimed “sending transponder.” (Ex. 1008 ¶190; Ex. 1006 at Fig. 3, 4:20–24). Hassett '389 discloses RF “tags” or “cards” that transmit a serial number to identify the vehicle. (Ex. 1006 at 1:32–37). Hassett '389 discloses the IVC also includes a serial number. (Ex. 1006 at 18:27–35 (“IVC serial num.”)).

A person of ordinary skill in the art would have understood the serial number (the claimed “code”) to uniquely identify the IVC (and hence the vehicle and registrant) to the program administrator—or would have found it obvious to so modify the system of Hassett '389. (Ex. 1008 ¶¶190–92). A person of ordinary skill in the art would have understood Hassett '389 to disclose transmitting the IVC serial number from the IVC, or have found it obvious to so modify the system of Hassett '389. (Ex. 1008 ¶¶190–91).

A person of ordinary skill in the art would have been motivated to include this element as it is disclosed by each of the references being combined. (Ex. 1008 ¶¶73, 190). Additionally, identification of the registrant using the section of highway enables the automatic collection of tolls by invoice or pre-paid account, as well as providing more comprehensive information for the disclosed traffic monitoring and management systems. (Ex. 1008 ¶191; Ex. 1004 at Abstract (“management of traffic”; Ex. 1006 at 16:17–21 (“accurate accounting of traffic activity”)).

- d. “a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.”

As discussed in Part V.A.2.d, Hassett ’183 discloses this element.

The RF transmitter and receiver/reader (also called a “reader unit”) of Hassett ’389 meets the claimed “reading data collector” limitation. (Ex. 1008 ¶197). Hassett ’389 discloses an RF transmitter and receiver/reader positioned at a toll collection facility. (Ex. 1006 at Fig. 1, 5:19–31). The RF transmitter initiates communication with the IVC, indicating a toll needs paid, and the RF receiver receives acknowledgement that the IVC has properly paid the toll. (Ex. 1006 at Fig. 1, 5:19–31). The Hassett ’389 reader unit provides information to the Toll Transaction Management (TTM) subsystem (the claimed “central processing facility”), such as “vehicle type,” which are recorded in TTM Records. (Ex. 1006 at 17:21–27, 18:17–26). Hassett ’389 discloses that the data recorded in the TTM records can, when required, be “date and time stamped.” (Ex. 1006 at 18:14–16).

A person of ordinary skill in the art would have understood Hassett ’389 to disclose including the IVC serial number in the acknowledgement, as was done in other systems with a vehicle tag, or have found it obvious to so modify the system of Hassett ’389. (Ex. 1008 ¶199). A person of ordinary skill in the art would have been motivated to include the IVC serial number or similar identification number in the combined system to enable more complete analysis of the recorded traffic

activity, as well as confirming the accuracy of toll transactions, and that they are being charged to the proper registrant. (Ex. 1008 ¶200; Ex. 1006 at 16:17–21; Ex. 1004 at Abstract, 3:1–3).

A person of ordinary skill in the art would have found it obvious to modify Hassett '389 to also receive, store, and transfer the IVC serial number to the TTM, along with a time/date stamp. (Ex. 1008 ¶199–206). As the combined system would include the claimed “code” and “time/date stamp,” it would have been inherent that the claimed information would have been stored, at least temporarily, between the receipt by the roadside equipment and the transfer of the information to the central processing facility. (Ex. 1008 ¶204). Furthermore, as Hassett '183 discloses the roadside transceivers can process some of the received information, the information must necessarily be stored in the transceiver during processing. (Ex. 1008 ¶205).

3. Claim 3 is obvious in light of Hassett '183 and Hassett '389
  - a. “The vehicle occupancy monitoring system of claim 1 wherein the said sending transponder also transmits the claimed number of vehicle occupants.”

As discussed in Part V.A.3, Hassett '183 discloses this element or renders it obvious.

Hassett '389 discloses including the “vehicle class” information as part of the acknowledgement signal. (Ex. 1006 at 8:26–30).

As discussed in Part V.F.2.a, a person of ordinary skill in the art would have understood to include “number of vehicle occupants” in the acknowledgement signal instead of or in addition to the “vehicle class.” (Ex. 1008 ¶209). A person of ordinary skill in the art would also have understood to include the IVC serial number in the acknowledgement signal. (Ex. 1008 ¶209).

As both Hassett ’183 and Hassett ’389 disclose this element, or render it obvious, a person of ordinary skill in the art would have considered it obvious to include this element in the combined system in order to accommodate HOT or HOV lanes. (Ex. 1008 ¶209). A person of ordinary skill in the art would have been motivated to use a single transponder, as it would result in a physically smaller and less expensive unit. (Ex. 1008 ¶209).

4. Claim 5 is obvious in light of Hassett ’183 and Hassett ’389
  - a. “The vehicle occupancy monitoring system of claim 3 further comprising: a visual display of the number of claimed occupants that can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

Hassett ’389 discloses using a light array to visually display the claimed “vehicle class.” (Ex. 1006 at 13:28–40). After receiving the vehicle class information, Hassett ’389’s reader unit causes a single light in the light array to illuminate, which represents the claimed “vehicle class.” (Ex. 1006 at 13:41–49). Enforcement personnel (the claimed “enforcement officer”) can then visually

observe the claimed “vehicle class” and actual vehicle as it passes. (Ex. 1006 at 13:49–56).

A person of ordinary skill in the art would have found it obvious to add the external visual display of Hassett ’389 to Hassett ’183 for enforcement of the toll roads or HOV lanes. (Ex. 1008 ¶214). As discussed in Part V.A.2.b, the Hassett ’183 system already collects and transmits information regarding the number of occupants in a vehicle. (Ex. 1008 ¶214). Thus it would be obvious to use Hassett ’183 for HOV lanes. (Ex. 1008 ¶212). It would have been obvious to add the “light array” of Hassett ’389 to Hassett ’183 and use it to indicate the “number of occupants” transmitted in Hassett ’183, rather than the transmitted “vehicle class” of Hassett ’389. (Ex. 1008 ¶214). This combination of Hassett ’183 and Hassett ’389 requires no changes to Hassett ’183 other than the addition of a light array and a signal from the Hassett ’183 roadside monitoring equipment to the light array indicating which light to illuminate as the vehicle passes by. (Ex. 1008 ¶215). The light array would thus be “a visual display of the number of claimed occupants that [could] be seen by an enforcement officer outside the vehicle as it traverses the highway.” (Ex. 1008 ¶216).

5. Claim 6 is obvious in light of Hassett ’183 and Hassett ’389

Claim 6 is substantially the same as Claim 1, but written in method form. (Ex. 1008 ¶47).

- a. “A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:”

As discussed in Part V.F.2.b, it would be obvious for the combination of Hassett '183 and Hassett '389 to transmit both the vehicle occupancy data and “vehicle class” data. The roadside equipment disclosed in both Hassett '183 and Hassett '389 would then receive the vehicle occupancy data, such as in the acknowledgement signal of Hassett '389.

As discussed in Part V.F.2.c, it would be obvious for the combination of Hassett '183 and Hassett '389 for the transponder or IVC to also transmit—and thus for the roadside equipment to receive—an IVC serial number or other identifier, thus identifying the registrant.

As discussed in Part V.F.2.a, this is all done as the vehicle in both references traverses a designated section of a highway (such as a toll road).

- b. “transmitting the number of occupants in a vehicle claimed by a registrant;”

As discussed in Part V.F.2.b, it would have been obvious for the IVC or transponder in the combination of Hassett '183 and Hassett '389 to transmit the number of occupants in a vehicle, as claimed by the registrant.

- c. “transmitting a signal from the vehicle that identifies the registrant;”

As discussed in Part V.F.2.c, as both references disclose this element it would have been obvious to include this element in the combined system.

- d. “and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway.”

As discussed in Part V.F.2.b, as both Hassett '183 and Hassett '389 disclose only a single transponder in the vehicle, the combination of the two would have used the same transponder to transmit both the number of occupants and the identification of the registrant. (Ex. 1008 ¶233). The roadside equipment would inherently read the signal, as both references disclose the roadside equipment querying the vehicle transponder and relaying the information to a central processing facility. As discussed in Part V.F.2.a, this is all done as the vehicle traverses a designated section of a highway (such as a toll road).

6. Claim 8 is obvious in light of Hassett '183 and Hassett '389
  - a. “The method of claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.”

As discussed in Part V.F.3.a, it would have been obvious to a person of ordinary skill for the combined system of Hassett '183 and Hassett '389 to transmit both the IVC serial number as well as the claimed number of occupants (instead of

or in addition to the vehicle class) in the acknowledgement signal. (Ex. 1008 ¶239).

7. Claim 10 is obvious in light of Hassett '183 and Hassett '389
  - a. “The method of claim 8 further comprising a visual display of the claimed number of occupants, which display can be seen by an enforcement officer outside the vehicle as it traverses the highway.”

As discussed in Part V.F.4.a, Hassett '389 discloses using a light array as the visual display for enforcement officers. (Ex. 1006 at 13:28–56; Ex. 1008 ¶¶182, 240). As discussed in Part V.F.4.a, it would have been obvious to a person of ordinary skill in the art to add the method of using the visual display of Hassett '389 to Hassett '183, so it would be present in the combined system, in order to provide an enforcement mechanism for the combined system. (Ex. 1008 ¶240).

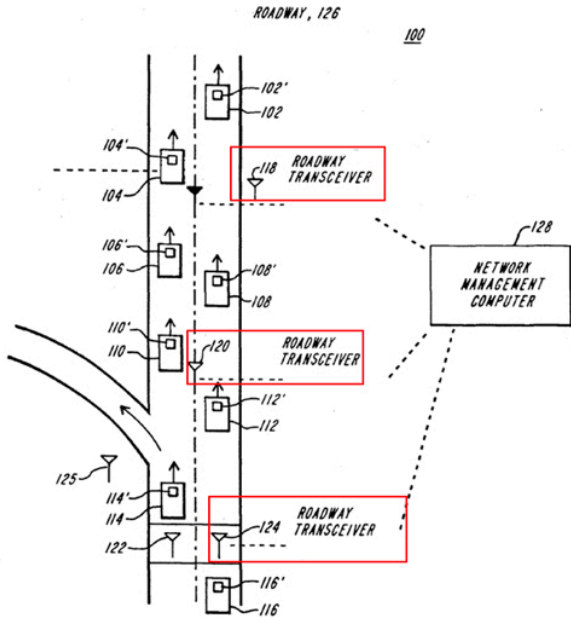


## VI. CLAIM CHARTS

The expert declaration of Scott Andrews contains similar charts with excerpts of the relevant language and additional citations. (Ex. 1008, Part X).

### A. Claim Charts for Hassett '183

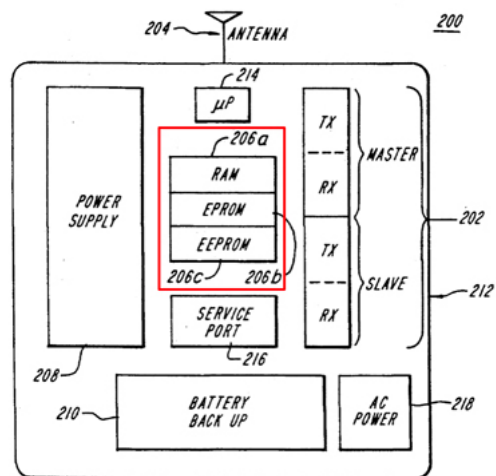
Claim 1 of the '101 Patent	U.S. Patent No. 5,289,183 (Hassett '183)
A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a vehicle as it traverses a designated section of highway:	<p><b>“registrant” claiming “number of occupants”:</b> E.g.: 4:44–47, 5:28–32</p> <p><b>“vehicle occupancy monitoring system”</b> E.g.: 5:28–32</p> <p><b>“traverse a designated section of highway”:</b> E. g.: 1:18–23, 5:34–35</p>
a transmitter that transmits a claim as to the number of occupants in the vehicle;	<p><b>“transmitter”:</b> E.g.: 2:38–41, 5: 32–41, 7:38–40, 7:45–47</p> <p><b>“transmit a claim as to the number of occupants in the vehicle”:</b> E.g.: 8:12–21</p>
a sending	<b>“transponder”:</b>

<p>transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;</p>	<p>E.g.: 2:38–41, 2:48–51, 5:32–34</p> <p><b>“code that uniquely identifies a registrant”:</b> E.g.: 2:48–51, 10:31–36</p>
<p>a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.</p>	<p><b>“reading data collector”:</b> E.g.: Figure 1</p>  <p><b>FIG. 1</b></p> <p>E.g.: 3:32–35 , 3:14–19</p> <p><b>“interrogate vehicle within its range”</b></p>

E.g.: 5:32–34

**“receive, store”:**

E.g.: Figure 2 (RAM, EEPROM, etc)



**FIG. 2**

E.g.: 6:12–17

**“transfer to a central processing facility”:**

E.g.: 2:51–58, 3:32–35, 5:16–19

**“transmitted code identifying the registrant”:**

E.g.: 2:48–51

**“time and date stamp”:**

E.g.: 8:1–4 , 2:48–51, 5:16–19

**Claim 3 of the  
'101 Patent**

**U.S. Patent No. 5,289,183 (Hassett '183)**

The vehicle

E.g.: 2:48–51, 6:67–7:6

<p>occupancy monitoring system of claim 1 wherein the said sending transponder also transmits the claimed number of vehicle occupants.</p>	
<p><b>Claim 6 of the '101 Patent</b></p>	<p><b>U.S. Patent No. 5,289,183 (Hassett '183)</b></p>
<p>A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:</p>	<p>See chart for Claim 1, above.</p>

transmitting the number of occupants in a vehicle claimed by a registrant;	See chart for Claim 1, above.
transmitting a signal from the vehicle that identifies the registrant;	See chart for Claim 1, above.
and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway	See chart for Claim 1, above.
<b>Claim 8 of the '101 Patent</b>	<b>U.S. Patent No. 5,289,183 (Hassett '183)</b>
The method of	See charts for Claims 1 and 3, above.

<p>claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.</p>	
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**B. Claim Charts for the Ontario Report**

<p><b>Claim 1 of the '101 Patent</b></p>	<p><b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b></p>
<p>A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of occupants in a</p>	<p><b>“vehicle occupancy monitoring system”:</b>  E.g.: Cover “Automated <u>Vehicle Occupancy Monitoring Systems</u> for HOV/HOT Facilities.”  <b>“claim is made by a registrant about the number of occupants in a vehicle”</b>  E.g.: Page i, 40, 18, 19, 85, 92  <b>“traverses a designated section of highway”</b>  E.g.: i, 1–2</p>

vehicle as it traverses a designated section of highway:	
a transmitter that transmits a claim as to the number of occupants in the vehicle;	<p><i>See Ontario Report, Table 3 at Page 39</i></p> <p><b>“transmitter”:</b> E.g.: 11, 19</p> <p><b>“transmits a claim as to the number of occupants in the vehicle”:</b> E.g.: 19–20, 11</p>
a sending transponder in the vehicle that transmits a code that uniquely identifies the registrant with the program administrator;	<p><i>See Ontario Report, Table 3 (Page 39)</i></p> <p><b>“sending transponder”, “transmits a code”</b> E.g.: 55, 19</p> <p><b>“transmits a code that uniquely identifies the registrant with the program administrator”:</b> E.g.: 94, Page 19, Page 40, 43 , 65</p>
a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code	<p><b>“reading data collector”:</b> E.g.: 19, 38, 42, 43, 56</p> <p><b>“interrogate a vehicle within its range”:</b> E.g.: 43, 40, 19</p> <p><b>“receive and store”:</b> E.g.: 46, 65</p> <p><b>“transfer to a central processing facility”:</b></p>

identifying the registrant along with a time/date stamp.	E.g.: 43, 56 <b>“a code identifying a registrant”</b> : E.g.: 19 <b>“time/date stamp”</b> : E.g.: 19, 31, 22
<b>Claim 3 of the '101 Patent</b>	<b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b>
The vehicle occupancy monitoring system of claim 1 wherein the said sending transponder also transmits the claimed number of vehicle occupants.	See Ontario Report, Table 3 at Page 39 E.g.: 11, 19–20
<b>Claim 5 of the '101 Patent</b>	<b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b>
The vehicle occupancy monitoring system of claim 3 further comprising:	See chart for Claim 3
a visual display of the number of claimed occupants that can be seen by	E.g.: 41–42



<p>an enforcement officer outside the vehicle as it traverses the highway.</p>	
<p><b>Claim 6 of the '101 Patent</b></p>	<p><b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b></p>
<p>A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of highway, said method comprising the steps of:</p>	<p>See chart for Claim 1 above</p>
<p>transmitting the number of occupants in a vehicle claimed by a registrant;</p>	<p>See chart for Claim 1 above</p>
<p>transmitting a signal from the vehicle that identifies the</p>	<p>See chart for Claim 1 above</p>

registrant;	
and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated section of highway	See chart for Claim 1 above
<b>Claim 8 of the '101 Patent</b>	<b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b>
The method of claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of	See charts for Claims 3 and 6, above.

occupants claimed by that registrant.	
<b>Claim 10 of the '101 Patent</b>	<b>Automated Vehicle Occupancy Monitoring Systems for HOV/HOT Facilities</b>
The method of claim 8 further comprising a visual display of the claimed number of occupants, Which display can be seen by an enforcement officer outside the vehicle as it traverses the highway.	See charts for Claims 8 and 5, above.

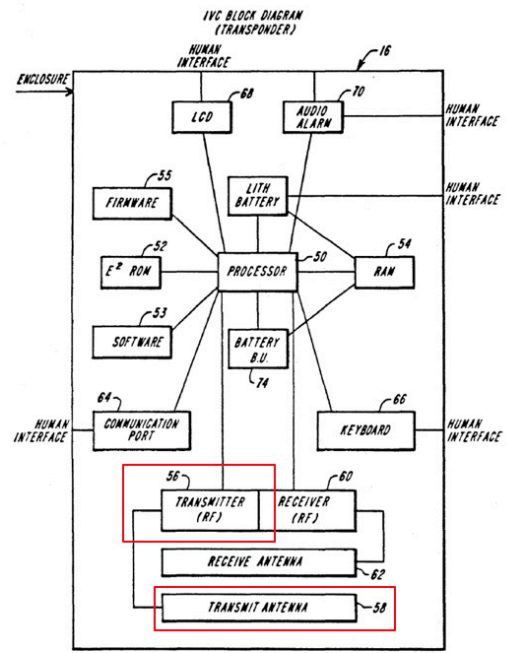
**C. Claim Charts for Hassett '389**

<b>Claim 1 of the '101 Patent</b>	<b>Hassett '389</b>
A vehicle occupancy monitoring system wherein a claim is made by a registrant about the number of	<p><b>“Claim”</b> E.g.: 13:21–27, 17:23–27</p> <p><b>“traverses a designated section of highway”</b> E.g.: 6:22–23</p>

occupants in a vehicle as it traverses a designated section of highway:

a transmitter that transmits a claim as to the number of occupants in the vehicle;

**“Transmitter”**  
 E.g.: Fig. 3, 7:25–33, 8:26–30



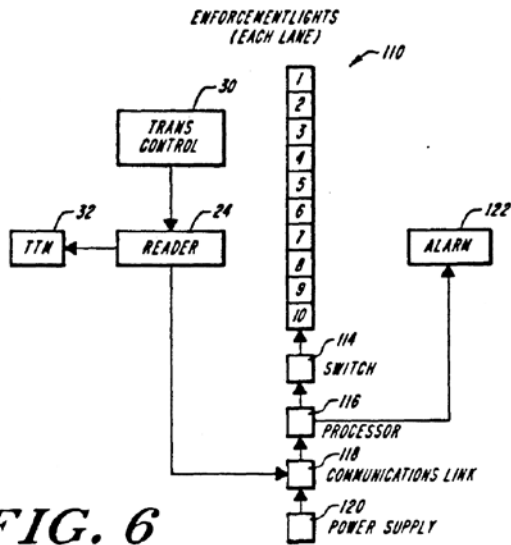
**FIG. 3**

a sending transponder in the vehicle that

**“transponder”**  
 E.g.: Fig. 3 (transponder) (see above), 4:20–24, 8:5–12

<p>transmits a code that uniquely identifies the registrant with the program administrator;</p>	<p><b>“code that uniquely identifies the registrant”</b> E.g.: 1:32–39, 18:27–35</p> <p><b>“[code that uniquely identifies the registrant] with the program administrator”</b> E.g.: 3: 54–56, Figure 8, 17:21–27</p>
<p>a reading data collector that can interrogate a vehicle within its range, and receive, store and transfer to a central processing facility said transmitted code identifying the registrant along with a time/date stamp.</p>	<p><b>“reading data collector that can interrogate a vehicle within its range”</b> E.g.: Fig. 1, 5:19–27, 4:52–56\</p> <p><b>“receive, store”</b> E.g.: 13:41–43, 13:4–7</p> <p><b>“transfer to a central processing facility”</b> E.g.: 17:21–27</p> <p><b>“transmitted code identifying the registrant”</b> E.g.: 1:32–39, 18:27–35</p> <p><b>“time/date stamp”</b> E.g.: 18:14–16, 18:50–57</p>
<p><b>Claim 3 of the '101 Patent</b></p>	<p><b>Prior Art</b></p>
<p>The vehicle occupancy monitoring system of claim 1 wherein the</p>	<p>E.g.: 8:26–30</p>

<p>said sending transponder also transmits the claimed number of vehicle occupants.</p>	
<p><b>Claim 5 of the '101 Patent</b></p>	<p><b>Prior Art</b></p>
<p>The vehicle occupancy monitoring system of claim 3 further comprising:</p>	<p>See claim chart for claim 3.</p>
<p>a visual display of the number of claimed occupants that can be seen by an enforcement officer outside the vehicle as it traverses the highway.</p>	<p>E.g.: Figure 6</p>



**FIG. 6**

E.g.: 13:28-40, 13:41-56

**Claim 6 of the '101 Patent**

**Prior Art**

A method of receiving claimed vehicle occupancy data about a vehicle by a registrant, and also identifying the registrant as the vehicle traverses a designated section of

See claim chart for Claim 1.

<p>highway, said method comprising the steps of:</p>	
<p>transmitting the number of occupants in a vehicle claimed by a registrant;</p>	<p>See claim chart for Claim 1.</p>
<p>transmitting a signal from the vehicle that identifies the registrant;</p>	<p>See claim chart for Claim 1.</p>
<p>and then receiving the claim by a registrant as to number of occupants in a vehicle and reading the signal from the vehicle that identifies the registrant as the vehicle transits the designated</p>	<p>See claim chart for Claim 1.</p>



section of highway	
<b>Claim 8 of the '101 Patent</b>	<b>Prior Art</b>
The method of claim 6 further comprising the transmission of number of occupants claimed by a registrant by a transponder that transmits a signal both identifying the registrant and the number of occupants claimed by that registrant.	See claim chart for Claim 3.
<b>Claim 10 of the '101 Patent</b>	<b>Prior Art</b>
The method of claim 8 further comprising a visual display of the claimed number of	See claim chart for Claim 5.

<p>occupants, Which display can be seen by an enforcement officer outside the vehicle as it traverses the highway.</p>	
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## **VII. CONCLUSION**

For the reasons described above, there is a reasonable likelihood that Petitioner will prevail as to each of claims 1, 3, 5, 6, 8, and 10 of the '101 patent, and there is a reasonable likelihood that at least one of the claims challenged in the petition is unpatentable. 37 C.F.R. § 42.108(c). Accordingly, *inter partes* review of claims 1, 3, 5, 6, 8, and 10 of the '101 patent is respectfully requested.

The USPTO is authorized to charge any required fees, including the fee as set forth in 37 C.F.R. § 42.15(a) and any excess claim fees, to Deposit Account No. 50-5723 referencing matter no. 02526.00001.

Respectfully submitted,

Dated: May 20, 2016

by: /Robert A. Auchter/

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**CERTIFICATE OF SERVICE (C.F.R. § 42.6(E)(4))**

I hereby certify that the attached Petition for Inter Partes Review and supporting materials were served as of the below date by FedEx Overnight Delivery on the Patent Owner at the correspondence address indicated for U.S. Patent No. 6,980,101:

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Respectfully submitted,

Dated: May 20, 2016

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