

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UBER TECHNOLOGIES, INC. and UBER FREIGHT US LLC,
Petitioners

v.

CARMA TECHNOLOGY LTD.,
Patent Owner

Patent No. 10,741,071

DECLARATION OF PETROS IOANNOU, PH.D.

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I, Petros Ioannou, declare as follows:

I. INTRODUCTION

1. I have been retained by counsel for Uber Technologies, Inc. and Uber Freight US LLC (“Petitioners”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 10,741,071, (“the ’071 patent”) (EX1001). I have been asked to consider whether certain references alone or in combination disclose or suggest the limitations recited in claims 1, 2, 10-15, 17-20 (“the challenged claims”) of the ’071 patent. My opinions are set forth below.

2. I am being compensated at my rate of \$500 per hour for the time I spend on this matter. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

II. QUALIFICATIONS

3. I have summarized in this section my educational background, career history, publications, and other relevant qualifications. My full curriculum vitae is attached as Exhibit 1003 to this report.

A. Educational Background

4. I received a Bachelor of Science degree in Mechanical Engineering from the University London (University College) in 1978 with first class honors, a Master of Science degree in Mechanical Engineering from the University of Illinois at Urbana Champaign in 1980 and a PhD degree in Electrical Engineering from University of Illinois at Urbana Champaign in 1982. My PhD thesis was on the topic of Robust Adaptive Control with applications.

B. Career History

5. In 1982 I became an assistant professor in Electrical Engineering and Systems at the University of Southern California (USC), Los Angeles, California. In 1987, I was promoted to associate professor at USC and in 1992 I was promoted to a Full Professor. I have courtesy appointments with the Departments of Aerospace and Mechanical Engineering and Industrial System Engineering and currently hold the A.V. “Bal” Balakrishnan Chair and the prestigious title of University Professor. I am the founder and Director of the Center for Advanced Transportation Technologies, an organized research unit at USC, and I am the co-

founder of the University Transportation Center METRANS at USC where I hold the position of associate research director. I am the founder and Director of the Master Degree program in Financial Engineering at USC and serve as the Director of the Center for Responsible AI in Decision Making in Finance supported by CapitalOne. Starting January 2026, I am the President of the IEEE Intelligent Transportation Systems Society (ITSS). Prior to 2026 I served as President Elect of the IEEE ITSS, Vice President (VP) for Membership, VP for Publications and served as Editor in Chief of the IEEE Transactions on Intelligent Transportation Systems. I have been a member of the National Academy of Engineering since 2022.

6. Vehicle Routing: I have over 30 years of experience in optimization applied to routing of passenger vehicles; trucks carrying and delivering containers; central coordination of schedules and routes of shuttles for airports using connectivity and central computers. My research team and I developed a centrally coordinated truck routing system where trucks send via communication links their origin and destination and desired time window to a central computer system which generates and communicates back their schedules and routes to reduce overall travel time. We also developed a centrally coordinated system for generating schedules and optimum routes for shuttles serving the Los Angeles international airport to reduce congestion at the curbside drop off and pick up points.

7. Intelligent Transportation Systems: These systems use vehicle to vehicle and vehicle to infrastructure communication together with control and optimization techniques to perform lane change control, dynamic speed assignment, ramp metering and traffic light control. These systems involve active communication between vehicles and a central computer system where algorithms and protocols are executed in real time. These technologies involve active communication between users and a central computer system, optimization and decision making without requiring any private information from the users.

C. Publications and Patents

8. I am the author/co-author of 11 books and over 400 publications in Journals and Conference proceedings in the areas of controls, automated vehicles, vehicle routing and intelligent transportation systems.¹ I have close to 40,000 citations with h-index 78 and i10-index 290 on Google Scholar².

9. Some of my representative publications about vehicle routing include:
Zheyu Wang, Maged Dessouky, Tom Van Woensel, Petros Ioannou, *Pickup and delivery problem with hard time windows considering stochastic and*

¹ <https://pioannou.usc.edu/>

² <https://scholar.google.com/citations?user=lvDGI2UAAAAJ&hl=en>

time-dependent travel times, EURO Journal on Transportation and Logistics, Volume 12, 100099, ISSN 2192-4376.³

Aristotelis-Angelos Papadopoulos; Ioannis Kordonis, Maged Dessouky; Petros Ioannou, *Personalized Freight Route Recommendations with System Optimality Considerations: A Utility Learning Approach*, Oct. 2022.⁴

Ioannis Kordonis, Maged M. Dessouky, and Petros A. Ioannou, *Mechanisms for Cooperative Freight Routing: Incentivizing Individual Participation*, IEEE Transactions on Intelligent Transportation Systems, vol. 21, no. 5, May 2020.

Jie Shi, Yuanqi Gao, Wei Wang, Nanpeng Yu and Petros Ioannou, *Operating Electric Vehicle Fleet for Ride-Hailing Services with Reinforcement Learning*, IEEE Transactions on Intelligent Transportation Systems, November 2020, Vol. 21, Issue 11, pp. 4822-4834.⁵

10. I also have three issued patents and two pending patent applications in control and transportation.

³ <https://doi.org/10.1016/j.ejtl.2022.100099>

⁴ <https://doi.org/10.1109/TITS.2022.3213773>

⁵ <https://ieeexplore.ieee.org/document/8878000>

III. SUMMARY OF OPINIONS

11. The opinions contained in this Declaration are based on the documents I reviewed and my professional judgment, as well as my education, experience, and/or knowledge regarding technologies relating to, among other things transportation systems.

12. In forming my opinions expressed in this Declaration, I reviewed the following materials, as well as any other materials referenced in this Declaration:

Reviewed Materials	
EX1001	U.S. Patent No. 10,741,071 (“the ’071 patent”)
EX1004	Prosecution History of U.S. Patent App. No. 16/698,401
EX1005	UK Patent Application No. GB2397683A to Olmi (“Olmi”)
EX1006	International Patent Publication No. WO 02/06994 A2 to Paul (“Paul”)
EX1007	International Patent Publication No. WO 00/76231 A1 to Jarvinen et al. (“Jarvinen”)
EX1010	U.S. Patent Application Publication No. 2003/0040944 to Hileman (“Hileman”)
EX1011	International Patent Publication No. WO 2004/081833 A1 to Poykko (“Poykko”)

EX1012	Japanese Patent Pub. No. 2003281692 to Takahiro et al. (“Takahiro”) and Certified Translation of Takahiro with Certification of Translation
EX1030	U.S. Patent Application Publication No. 2001/0037174 to Dickerson (“Dickerson”)
EX1031	U.S. Patent Application Publication No. 2003/0036935 to Nel (“Nel”)
EX1032	International Patent Publication No. WO 2005/104059 A2 to Bhushan (“Bhushan”)
EX1033	U.S. Patent No. 5,799,263 to Culbertson (“Culbertson”)
EX1034	“A distributed geographic information system for the daily car pooling problem,” Roberto Wolfler Calvo et al. Computers & Operations Research 31 (2004) 2263-2278 (“Calvo”)
EX1035	U.S. Patent No. 10,520,325 to Lewinson (“Lewinson”)

13. In support of my opinions, I have taken into account how a person of ordinary skill in the art (as I discuss below in Section IV) would have understood the claims and the specification of the '071 patent at the time of the alleged invention, which I have been asked to assume is around and no later than February 12, 2007. My opinions reflect how such a skilled person would have understood the '071 patent, the references, and the state of the art at the time of the alleged invention.

14. As I discuss in detail below, it is my opinion that the combination of Olmi, Paul, and Jarvinen discloses or suggests all of the limitations of claims 1, 2, 10-15, and 17-20. (*See* my discussion below in Section IX.A.) A person of ordinary skill in the art would have had reason to combine the teachings of these references and would have been able to do so with a reasonable expectation of success. (*See* my discussions below in Sections VIII and IX.)

IV. PERSON OF ORDINARY SKILL IN THE ART

15. I have been asked to consider the time of the alleged invention for the challenged claims of the '071 patent to be around and up to February 12, 2007. I understand from reviewing the '071 Patent that this is the same date as the filing date of "Provisional application No. 60/900,808" that is identified on the Cover of the patent. (EX1001 at Cover ("Related U.S. Application Data").) Accordingly, I applied this understanding in my analysis herein.

16. Based on my knowledge and experience, I understand what a person of ordinary skill in the art would have known at the time of the alleged invention that I considered above. My opinions herein are, where appropriate, based on my understanding as to a person of ordinary skill in the art at the time of the alleged invention. In my opinion, based on the materials I have reviewed, and based on my experience in the technical areas relevant to the '071 patent, a person of ordinary skill in the art at the time of the alleged invention of the '071 patent would have had at least a bachelor's degree in computer science, computer engineering, software engineering, electrical engineering, or the equivalent and at least two years of experience in technologies relevant to or utilized in transportation systems. More education can substitute for practical experience and vice versa.

17. My opinions in this Declaration, including my analysis of the '071 patent and the references, are from the perspective of a person of ordinary skill in

the art, as I defined it above, during the relevant time frame around and up to February 12, 2007. I possessed at least the qualifications of such a person of ordinary skill in the art at that time.

V. TECHNOLOGICAL BACKGROUND

18. In this section, I discuss the state of the art relevant to the subject matter of the '071 patent as would have been known, understood, and appreciated by a person of ordinary skill in the art at the time of the alleged invention for the '071 patent. In particular, a person of ordinary skill in the art would have been aware of various developments in the areas of transportation systems and related processes, as I discuss below. This section is not intended to be technically comprehensive, but rather provide a foundation for the knowledge of a person of ordinary skill in the art at the relevant time. I rely on the following discussions and identified exhibit disclosures to support my opinions in Section IX, as they summarize features that a person of ordinary skill in the art would have been aware of, appreciated, and understood at the time of the alleged invention for the '071 Patent. Accordingly, I incorporate such disclosures and understanding in support of my opinions below concerning the knowledge of such a person or ordinary skill in the art at the relevant time, and how such knowledge and understanding would support my opinions concerning the features disclosed in the prior art and reasons for combining features similar to those disclosed in that prior art in such a manner that, in my opinion, predictably results in a system or method that meets the limitation of the challenged claims of the '071 patent as I discuss below in Section IX.

19. Transportation systems were well-known prior to and at the time of the alleged invention of the '071 patent as a means of addressing widespread traffic congestion problems. Traffic congestion was a known problem with wide-ranging consequences, including those related to the transportation of persons and goods.

20. For example, Olmi (EX1005),⁶ which I discuss further below, explains the known critical problems relating to “road traffic congestion.” (*Id.*, 3 (§3).) Travel times, parking, road network maintenance costs, pollution, and even traveler stress and related health concerns stemming from traffic congestion are issues that a person of ordinary skill in the art would have appreciated and contemplated when considering mechanisms to address them. (*Id.*, 3 (§3), 8 (§4.4); *see also* EX1030, ¶¶[0005]-[0012] (describing the “very serious concerns” relating to the growing reliance on individual transportation”); EX1010, ¶¶ [0002]-[0005]; EX1033, 1:6-61; EX1035, 1:25-55 (describing known traffic and pollution issues caused by single-occupancy vehicles).)

21. Those of ordinary skill in the art would have also understood and been aware of transportation systems and related processes that were designed to address such issues and to improve transportation efficiency of travelers and goods. For

⁶ Citations to EX1005 are to the underlying document page number(s) or Section number(s).

example, as I describe in detail below, Olmi discloses several known transportation systems and related processes that were designed to improve transportation issues known in the art and improvements Olmi sought to provide to such existing systems and approaches, include systems to facilitate carpooling and leverage of existing fixed route transportation network infrastructure. (*See e.g.*, EX1005, 4-9 (§§ 4-5.1), 19 (“seamlessly integrate with existing public transport”), 62-63; *see also* my discussions of Olmi below in Sections VIII and IX.) Other disclosures summarize approaches in transportation systems that were likewise known and appreciated by those of ordinary skill in the art at the time. (*See e.g.*, EX1010, Abstract, ¶¶ [0006]-[0011], [0024]-[0035], FIGS. 1-8; EX1031, ¶¶ [0001]-[0016], [0025]-[0027] (describing transportation system for freight hauling); EX1032, Abstract, 1-3 (describing vehicle pooling transportation system processes); EX1033, Abstract, 2:64-5:41, FIGs. 1-5; EX1034, Abstract, 2263-65 (§§ 1-2), 2266-2272 (§§ 3-4.1.1), 2274-2277 (§§ 5-6); EX1035, 1:59-3:22, 3:48-7:29, FIGS. 1A-6.)

22. Use of communication devices in transportation systems was also widely known by those of ordinary skill in the art. (*See e.g.*, EX1005, 29-32, 40 (§§ 6.2, 7, 7.2), FIGs. 4, 6; EX1010, ¶¶ [0025]-[0027], FIG. 1; EX1031, ¶¶ [0027]-[0029], [0051]-[0052], FIGS. 4A-4B; EX1032, Abstract, 1-5, 8-11, Figure sheets 1-3; EX1033, Abstract, 2:64-5:41, 6:19-8:62, FIGs. 1-5; EX1034, 2267.) Similarly, the use of networked computer systems and servers for managing transportation

system components and processes was known and understood by those of ordinary skill in the art. (*See e.g.*, EX1005, (§§ 6.2, 7, 7.2), FIGs. 4, 6; EX1010, ¶¶ [0021]-[0028], FIG. 1; EX1031, ¶¶ [0030]-[0050], FIGs. 2, 3A-4B; EX1034, 2269-2271 (§§ 3.2-4).)

23. Based on my experience, and from my review of the materials I identify in this Declaration, it is my opinion that a person of ordinary skill in the art at the time of the alleged invention would have been well aware of different transportation systems and processes designed to address known traffic and related issues with the transportation of vehicles, persons, and goods. This includes the use of carpooling and other types of ridesharing applications that leveraged and enhanced existing technologies related to fixed route transportation networks and other ridesharing optimization mechanisms. Given such knowledge and experience, and understanding of the technology underlying such transportation systems and processes, a person of ordinary skill in the art would have had reasons to consider the collective teachings of the prior art I discuss below in Section IX and integrate features and/or functionalities from such disclosures while leveraging their own experience and knowledge of existing transportation systems (consistent with those I discuss above in this section) to configure and provide transportation systems and processes that provide shared transport solutions, and communication protocols, consistent with that in the art at the time.

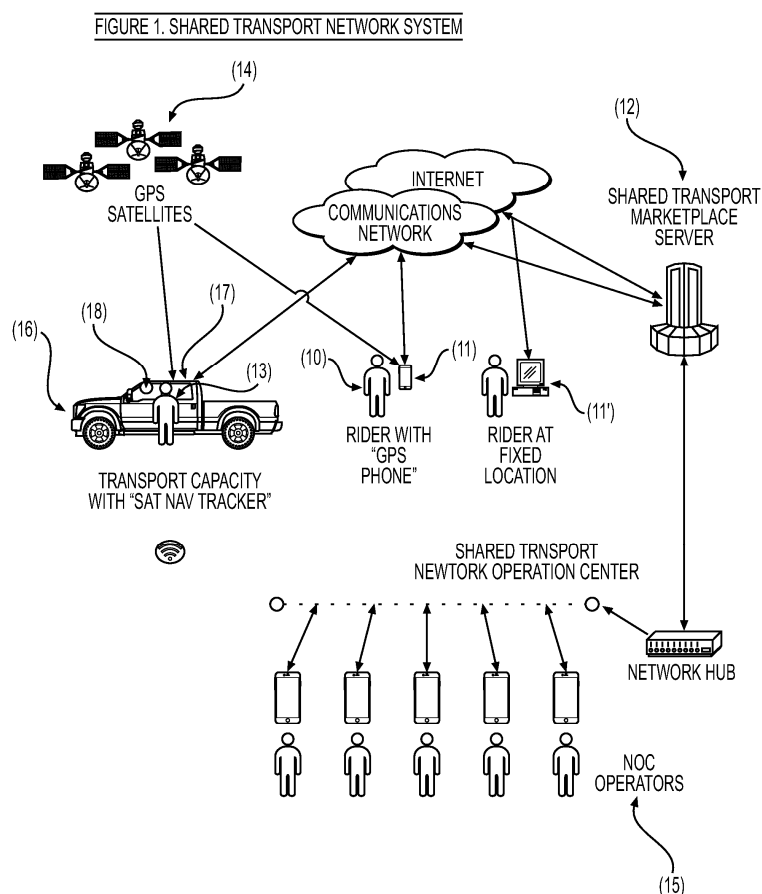
VI. OVERVIEW OF THE '071 PATENT

24. Based on my review, I understand the '071 patent “relates to a ground transportation network” that for example “match[es]” individuals with transport capacity on a supply and demand basis.” (EX1001, 1:20-23.) Consistent with my discussions above in Section V, the '071 patent discusses conventional transportation systems, processes, and concepts directed to addressing known transport capacity and demand issues consistent with what would have been known and appreciated by a person of ordinary skill in the art prior to and at the time of the alleged invention for the '071 patent. For example, the '071 patent describes a conventional central assigning system that works in conjunction with vehicle communication devices and employs known dynamic ridesharing and transportation network concepts. (*Id.*, 1:24-2:63.) The '071 patent also describes the use of existing traffic measurement systems, GPS systems, and traffic speed measurement systems (*Id.*, 3:63-4:9), and describes features of current carpooling systems and mass transport systems that give “confidence” to transport users on available capacity (*Id.*, 4:18-32). Thus, the '071 patent acknowledges that implementing existing proposals for dynamic ridesharing systems “*would represent advances over methods in common practice.*” (*Id.*, 1:50-51.)

25. However, I understand that the '071 patent expresses a belief that the alleged invention “makes such systems more practical and useful” by purportedly

reducing workload and/or steps necessary “to make this system more inconvenient,” improving “trustability,” increasing use, providing a device that communicates “visually” to riders, determining and/or registering transport capacity, and providing information about “ad-hoc” transport capacity “*in manners similar to traditional, centrally controlled transit systems.*”⁷ (*Id.*, 1:50-1:67.) The ’071 patent discusses its “Shared Transport System” (or marketplace) in the context of Figure 1 (below), which purportedly “enabl[es] private transport vehicles to serve as an extension of the mass transit system” by matching potential riders with potential drivers for the transport of persons. (*Id.*, 3:46-50; *see also id.*, 2:64-5:14, FIG. 1.)

⁷ Unless I have otherwise noted, the emphasis provided in portions of the referenced text is added.



(*Id.*, FIG. 1.) The specification repeatedly frames matching as being performed against transport-provider-declared/registered supply routes, with riders selecting pick-up/drop-off nodes along (or near) those routes, rather than requiring providers to generate a door-to-door route in response to each rider request. (*See id.*, 5:25-37, 14:32-36, 14:61-66, 16:41-65, FIGS. 5a-5b, 6a, 14a.)

26. Beyond many other conventional features (as I have demonstrated below in Section IX), the '071 patent discusses a rider/driver proxy messaging features aimed at allowing a rider and driver to contact each other via messages (e.g., SMS, email) in certain cases, such as in the event of a lost item in the vehicle or if

the users need to arrange transport details before the ride, while still keeping contact details and identity information private. (*Id.*, 13:15-24, 13:51-54.) For example, “if a Driver 13 identifies lost items left in their vehicle, they could choose a function on the in-vehicle device (or via a web page), to send a message to the Rider 10.” (*Id.*, 13:32-35.) “The system 12 would then receive this message 131, evaluate the content for appropriate content 132, and if it could automatically determine this, would redirect the message 134 on to the Rider 10, coding the message with a unique identifier so that it would know to respond to the Driver 13 if the Rider 10 responds.” (*Id.*, 13:35-40.)

27. The '071 patent also describes how “[i]f the system could not automatically approve the content,” an operator may review the content to determine if the content is appropriate and the message should be passed on, or if the content is inappropriate and the message should be rejected and/or the driver should be blacklisted, have their message capabilities restricted, or have a rating adjustment made because of misuse of the system. (*Id.*, 13:40-50.)

28. The claims of the '071 patent were allowed (and subsequently issued) after minimal examination, where the Office did not apply any prior art rejections, instead only raising enablement issues. (EX1004, 12-14, 25-37, 39-43.)

29. As I explain below, it is my opinion, based on my review of the materials referenced herein and my experience, these and other features described in

the challenged claims of the '071 patent were known in the prior art before the alleged invention of the '071 patent. (*See my discussions below in Section IX.*)

VII. CLAIM CONSTRUCTION

30. I understand that terms of the challenged claims should be interpreted as would have been understood by a person of ordinary skill in the art at the time of the alleged invention, taking into consideration the language of the claims, the specification, and the prosecution history of the '071 patent (EX1004) at the time of the alleged invention (around and up to February 12, 2007). I have applied these understandings of the claim terms in my analysis and in forming my opinions where appropriate in this Declaration.

31. I also have been asked to provide my opinions regarding the challenged claims of the '071 patent and the prior art discussed in this Declaration under the following constructions for the following claim terms, which I understand are proposed by Petitioners or Patent Owner (PO), as indicated in the table below. I applied those meanings as presented in support of my opinions as requested. My opinions below regarding the challenged claims also demonstrate how the claimed features are disclosed and/or suggested even if no such express constructions are applied.

'071 Patent Term	Constructions
“shared transport system” (claims 1, 14, 20)	<u>Petitioners’ Construction</u> : “A server system that matches transport users with transport providers

'071 Patent Term	Constructions
	traveling an existing route defined before demand for transport and independently of a transport user's door-to-door trip."
"transport provider" (claims 1, 14, 20)	<u>Petitioners' Construction:</u> "A driver offering transport along an existing route defined before demand for transport and independently of a transport user's door-to-door trip."
"pick-up location" (claims 1, 14, 20)	<u>Petitioners' Construction:</u> "A node along an existing route defined before demand for transport and independently of a transport user's door-to-door trip."

VIII. OVERVIEW OF THE REFERENCES⁸

A. Overview of Olmi (EX1005)

32. Based on my review, a person of ordinary skill in the art would have understood that Olmi discloses a method/system that leverages existing features/concepts from public transport and individual transport applications to address transportation problems. (EX1005, 8-9 (§5.1).) Olmi teaches a transportation sharing process where a central computer system analyzes “submitted itinerary requirements that it receives, and then intelligently groups travellers with compatible itineraries onto the same...transit vehicle” (*id.*, Abstract) to address problems with inefficient use of transportation services, among other things, in existing transportation networks (*id.*, 2-7 (“present invention is the breakthrough solution to transport problems and traffic congestion” by providing a “minimal impact system, which easily coexists with other forms of transport, and other traffic control schemes” while “maintaining people-mobility”), 4-7 (§§4.1-4.4).)

⁸ These summaries of the references in Section VIII are applicable to my analysis below in Section IX. Accordingly, I incorporate these summaries, which reflect how a person of ordinary skill in the art would have understood the references, into my analysis below where discussing the disclosures and suggestions as appropriate.

33. One configuration that Olmi describes relates to carpooling transport. (*Id.*, 8.) The carpooling configuration matches prospective passengers with carpool drivers having compatible itineraries involving fixed journeys. (*Id.*) An itinerary is a data structure that specifies a travel plan (e.g., embarkation and disembarkation points, but can include multiple destination points, routing requirements, etc.). (*Id.*, 11-12, 32-35.)

34. Olmi explains that both carpool drivers with personal fixed itineraries and potential passengers are considered travellers, i.e., a person with a journey itinerary. (*Id.*, 11.) Travellers (both drivers and passengers) submit their predetermined personal itineraries to the central computer system by submitting a “journey request,” which is a data structure or a computer data format which includes a specification of a traveller or passenger itinerary,” as well as “other travel requirements relating to this itinerary.” (*Id.*, 12.) Prospective travellers define their predetermined personal itineraries by using a communicator device to send their journey requests to a central controlling computer system, which stores journey requests in a “journey requests database.” (*Id.*, 32.) Olmi also explains that “[m]athematically speaking, using the terminology of graph theory,” each traveller/passenger itinerary “can be encoded as a directed graph whose vertices are the embarkation and disembarkation points of the itinerary, and whose direct edges indicate the direction of travel.” (*Id.*, 11.)

35. Olmi explains that a vehicle can have a vehicle itinerary, which is a data structure that specifies the travel plan of the vehicle and comprises a “set of prescribed geographic points or addresses to which the vehicle must navigate in a prescribed order” and may include a “specification of the road route that will enable the vehicle to reach the said geographic points or addresses.” (*Id.* 11-12.) “Typically these geographic points [of the vehicle itinerary] will be traveller embarkation and destination points,” e.g., pick-up and drop-off points for passengers of the vehicle, as well as points corresponding to “additional stops en route.” (*Id.*, 12). Similar to traveller itineraries, each vehicle itinerary “can be encoded as a directed graph whose vertices are the said geographic points or addresses, and whose direct edges indicate the direction of travel between these geographic points or addresses.” (*Id.*)

36. For example, carpool drivers may have a “car pool intended itinerary specification,” which “include[s] details of the vehicle itinerary that the car pool driver intends to follow,” as well as “related information such as the number of available passenger seats in the car pool vehicle.” (*Id.*, 12.) A carpool driver may use a communicator device in their vehicle to “submit his car pool intended itinerary specification...to the controlling computer system.” (*Id.*, 35; *see also id.*, 15, 32, 40.) The vehicle itineraries are stored in a “transit vehicle current itineraries database,” which contains transit vehicle records for currently operational transit vehicles, i.e., “a vehicle that is currently conveying travellers, or a vehicle that is

currently empty but is ready to convey travellers.” (*Id.*, 34.) Carpool intended itinerary specifications are also “entered in the journey request database as a journey request record, with a relational link set up from this transit vehicle record to this journey request record...because [the carpool driver] is also a traveller, and his personal itinerary forms part of the itinerary commitments of his vehicle.” (*Id.*, 35.)

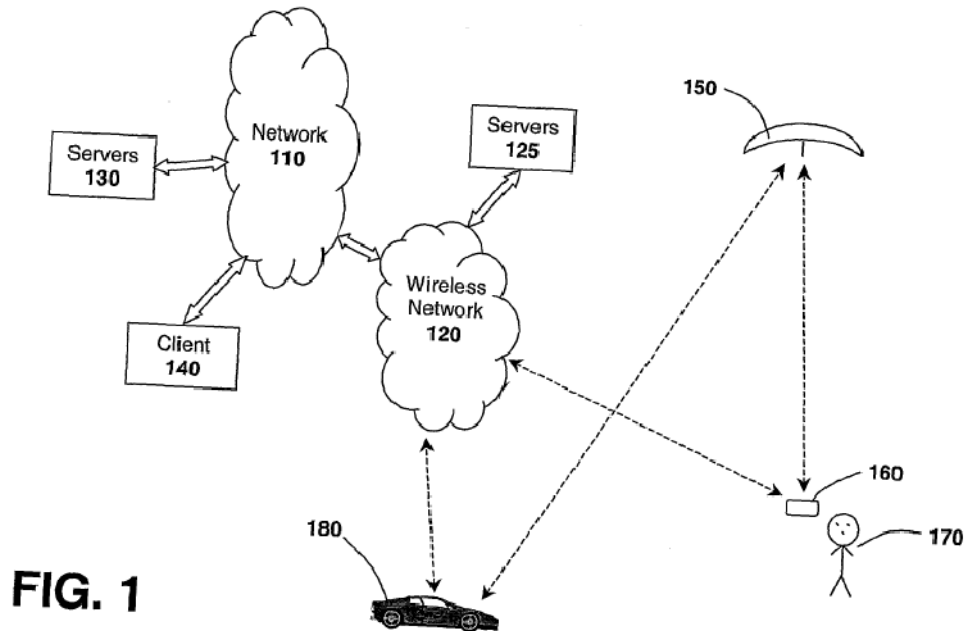
37. Olmi also describes intelligent grouping processes that match vehicles/drivers having a predetermined vehicle journey with a traveller having a compatible journey itinerary and facilitating the transportation of the traveller along the vehicle’s journey route. (*Id.*, 15-20 (§§5.5-5.6), 21-27 (§5.7), 35-39.) For example, Olmi describes matching prospective travellers/passengers from the journey request database with available carpool drivers from the transit vehicle current itineraries database. (*Id.*, 35-39.) Olmi also describes other features/components, including a digitised street layout map, communicator devices, controlling computer, positions/navigation systems, and a data transmission system. (*Id.*, 12-15 (§§5.3-5.4).)

B. Overview of Paul (EX1006)

38. Based on my review, a person of ordinary skill in the art would have understood that Paul discloses a system and method for providing transportation services over a data communications network. To achieve those objectives, Paul describes a computer implemented method for determining an efficient

transportation route comprising “compiling travel data over one or more travel segments, the travel data transmitted from one or more transportation vehicles traveling over the travel segments; receiving positional data associated with a transportation request, the positional data including an origin and a destination; and providing a driver of a vehicle with a first efficient route from the origin to the destination using the travel data, the first efficient route including one or more of the travel segments.” (EX1006, 2.)

39. Additionally described is a computer-implemented method for providing transportation services comprising: receiving a transportation request from a passenger; tracking the passenger's position following the request using positional detection logic; and transmitting positional data identifying the passenger's position to a pickup vehicle.” (EX1006, 2.)



40. Figure 1, shown above, illustrates an exemplary network architecture including a wireless communication network 120 for supporting communication between two or more wireless devices 160. (EX1006, 3.) The network/data center servers, as exemplified above in figure 1, may also encompass the servers of the wireless communication network, as well as the servers of a larger network 110, such as the Internet, that may be linked to the wireless communication network for a plurality of servers 130 and clients 140 to communicate. (EX1006, 3.)

41. Paul also discloses a computer-implemented method for a transportation ecosystem comprising a wireless network with network/data center servers, through which the mobile devices of potential passengers and drivers communicate. (EX1006, 8.)

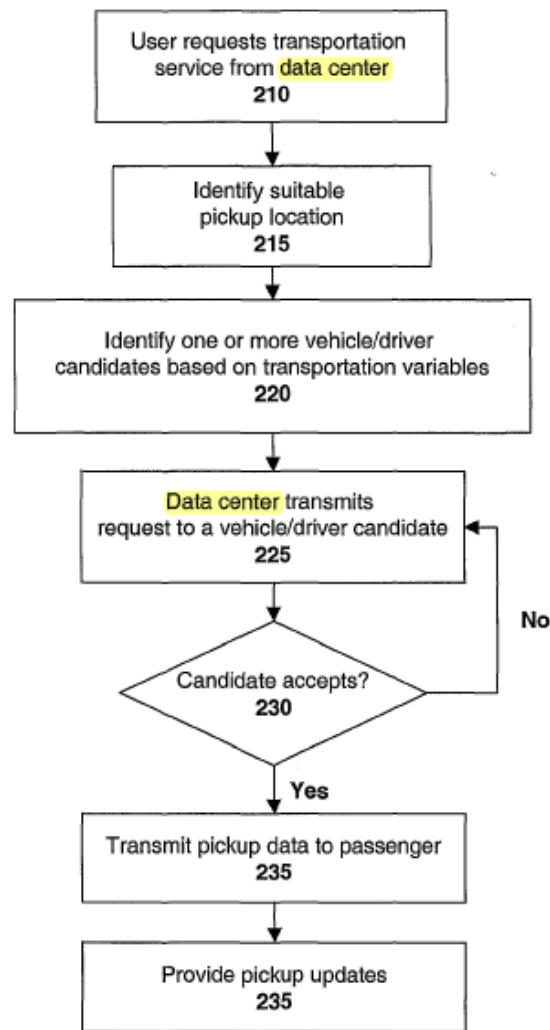


FIG. 2

(EX1006, FIG. 2 (annotated).)

42. A person of ordinary skill in the art would have understood, based on Figure 2 and its related disclosures, that Paul discloses that the network/data center servers connect potential passengers and drivers by receiving transportation requests from potential passengers, matching the passenger to a potential driver, and transmitting the request to that driver.

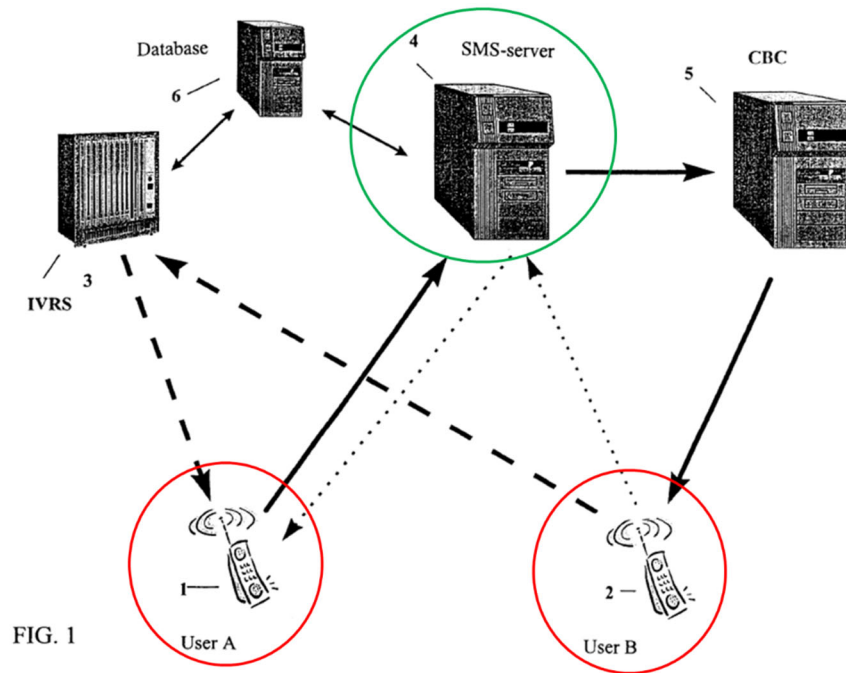
43. As I discuss further below (*See* my discussions below in Section IX) Paul discloses a system and method for determining an efficient transportation route, consistent with the features found in the challenged claims.

C. Overview of Jarvinen (EX1007)

44. Based on my review, a person of ordinary skill in the art would have understood that Jarvinen discloses a method of implementing a proxy messaging system. Specifically, Jarvinen discloses a “method for transmitting a message in a communications service operating through a mobile telephone network.” (EX1007, Abstract.)

45. Additionally, Jarvinen’s system discloses, customers addressing a message to at least one other customer, with the message being routed through an SMS server before eventually reaching the intended customer. Jarvinen explains that its method and system are implemented via a CHAT2000 program that operates on a conventional mobile telephone to aid in “concealing the real identity of the customer.” (EX1007, Abstract, 3:1-3.)

46. Jarvinen explains that “[u]sers can communicate with others who are logged on as users of the system, whenever their terminal device is in the operating area of the mobile telephone network.” (*Id.*, 2:17-18.) A person of ordinary skill in the art would have understood that in Figure 1 (annotated below), the communication between users’ mobile devices is routed through the SMS server.



47. As I discuss further below (Section IX.A), Jarvinen discloses a method of implementing a proxy messaging system, consistent with the features recited in the challenged claims.

IX. THE PRIOR ART DISCLOSES ALL OF THE LIMITATIONS OF THE CHALLENGED CLAIMS

A. The Combination of Olmi, Paul, and Jarvinen Discloses or Suggests the Limitations of Claims 1, 2, 10-15, and 17-20

48. In my opinion, Olmi in combination with Paul and Jarvinen discloses or suggests all of the limitations of claims 1, 2, 10-15, and 17-20. Below, I address each limitation of the claims.

1. Claim 1

i) [1.pre] A method of exchanging messages between entities of a shared transport system, the method comprising:

49. I have been asked to assume that the preamble of claim 1 is limiting. Under that assumption, it is my opinion that Olmi in view of Paul discloses/suggests the limitations therein.⁹

⁹ Olmi describes the invention as having two configurations—taxibus and carpooling—that may operate independently or concurrently, and discloses embodiments that integrate features of both. (EX1005, 8, 30.) A person of ordinary skill in the art would have understood that these configurations address substantially similar transportation problems using comparable hardware and communication architectures, and therefore any features described solely with respect to the taxibus configuration could readily be implemented in the carpooling configuration. (*Id.*,

50. In my opinion, Olmi discloses “entities of a shared transport system.”¹⁰ Olmi discloses a method and system, like the '071 patent's method/system, leverages existing features/concepts from public transport and individual transport applications to address transportation problems. (EX1005, 8 (§5.1).) For example, Olmi teaches a transportation-sharing process where a central computer system analyzes “submitted itinerary requirements that it receives, and then intelligently groups travellers with compatible itineraries onto the

66.) Therefore, even if any of the features that I rely on herein were assumed to arise solely from the taxibus configuration or from a separate embodiment, a person of ordinary skill in the art would have viewed their incorporation into the carpooling configuration as a routine design choice involving the application of known technologies using known techniques. (*Id.*, 5, 9, 11-14, 59, 66.) For example, Olmi's discussion of integrating public transport stops, fixed embarkation points, and kiosk communicator devices further confirms that such features would predictably yield the same benefits when applied to carpooling. (*Id.*, 40, 70, 78.) For these reasons, a person of ordinary skill in the art would have had both good reason and a reasonable expectation of success in implementing any taxibus-specific features in Olmi's carpooling configuration.

¹⁰ I have underlined claim language throughout my Declaration.

same...transit vehicle” (*id.*, Abstract) to address problems with inefficient use of transportation services, among other problems, in existing transportation networks (*id.*, 2-7, *e.g.*, 3 (“present invention is the breakthrough solution to transport problems and traffic congestion” by providing a “minimal impact system, which easily coexists with other forms of transport, and other traffic control schemes” while “maintaining people-mobility”), 4-7 (§§4.1-4.4).)

51. One configuration of the method/system that Olmi describes relates to “car pooling transport,” as explained below:

To achieve these objectives, this invention has two main configurations: electronic navigation taxibus transport, and **car pooling transport**. This invention can run either of these configurations separately, or can run them both at the same time.

(*Id.*, 8.)

52. This configuration provides a very effective means of matching prospective passengers with car pool drivers having compatible itineraries.” (*Id.*, 9.)

53. Olmi explains that both carpool drivers with personal fixed itineraries and potential passengers are considered travellers, meaning a person with a journey itinerary. (*Id.*, 11.) For example, Olmi explains:

In this document the term traveller is used to denote a person journeying on their own itinerary, which **includes drivers journeying on their own itinerary**. The term passenger denotes any person journeying on their own itinerary, excluding drivers. The term driver covers both drivers who are travellers (such as car pool drivers and drivers of the self-drive transit vehicle described in section 9.21, who are journeying

on their own itinerary), as well as drivers who are not travellers (such as taxibus drivers, who have no itinerary of their own).

(*Id.*)

54. An “itinerary” is a “data structure or a computer data format” that specifies a “travel plan,” which may include, among other things, the embarkation and disembarkation points and routing requirements. (*Id.*, 11; *see also id.*, 12, 32-35.) Olmi also explains that a vehicle can have a “vehicle itinerary,” which is a data structure that specifies the travel plan of the vehicle and comprises a “set of prescribed geographic points or addresses to which the vehicle must navigate in a prescribed order” and may include a “specification of the road route that will enable the vehicle to reach the said geographic points or addresses.” (*Id.*, 11-12.)

55. As I discuss for limitation [1.a.i], a passenger submits a “journey request” to the central computer system, which defines the passenger’s predetermined personal itineraries. (*Id.*, 12, 15, 18, 32; *see also* my discussion for limitation [1.a.i].) As I also discuss for limitation [1.a.ii], a carpool driver also submits their intended personal itinerary, which forms part of the itinerary commitments of the driver’s vehicle, and so Olmi’s central computer system stores a relational link between these itineraries. (EX1005, 35; *see also* my discussion for limitation [1.a.ii].)

56. Olmi also describes “intelligent grouping” processes that match vehicles/drivers having a predetermined vehicle journey with a passenger having a compatible journey itinerary and facilitating the transportation of the passenger along the vehicle’s journey route. (EX1005, 15-20 (§§5.5-5.6), 21-27 (§5.7), 35-39; *see also my discussion for limitation [1.a].*)

57. Referring to Figure 4 below, Olmi uses a “central controlling computer system 15 [that] has, by means of the data transmission system 16, a two-way communications connection with the communicator devices 17 and 18 of the prospective travellers 19, and a two-way communications connection with the communicator devices 20 of the transit vehicles 21.” (EX1005, 29.)

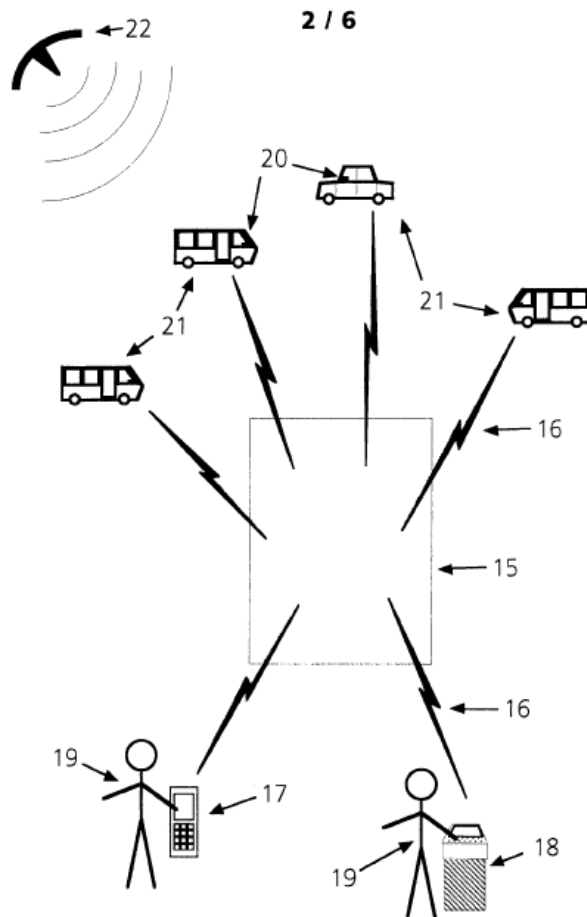


Figure 4

(*Id.*, FIG. 4.)

58. The “single central controlling computer system 15 orchestrates all transit vehicles 21 and travellers 19.” (*Id.*, 31.) Olmi explains that each passenger and driver has a “communicator device” that allows them to “interact[] with this transportation invention...to send and/or receive data over the data transmission system (typically to the controlling computer system).” (*Id.*, 14.) “Examples of

communicator devices include the telephone, the cellular telephone, the wireless PDA (Personal Digital Assistant), and an Internet-connected personal computer.” (*Id.*, 14.)

59. Olmi’s central controlling computer system is itself a “data-processing system” that may “compris[e] one or more mainframe computer data-processing installations, or compris[e] a set of distributed...computer processors.” (*Id.*, 13.) “A data transmission system 16 comprising land lines, cellular telephone networks, and Internet transmission is used to provide a two-way data exchange between this centralized controlling computer system 15 and the communicator devices 17 and 20 (of the travellers 19 and transit vehicles 21 respectively).” (*Id.*, 31.) “[T]he data transmitted over the data transmission system 16 will consist of such information as journey requests detailing the itinerary requirements of travellers, the controlling computer system’s responses to these journey requests sent back to travellers, and other categories of information.” (*Id.*, 30.) Olmi explains that its transportation sharing features (e.g., for matching drivers and passengers) may be enabled by using an “electronic positioning system...such as the American GPS (Global Positioning System), the broadcast positioning signal of which is received by GPS receivers contained in the vehicle communicator devices (and optionally in passenger communicator devices).” (*Id.*, 31.) Olmi explains that this system in Figure 4 is

“capable of running the invention’s two main transport modes,” including the carpooling mode. (*Id.*)

60. In addition to enabling carpool transport via the central computer system and data transmission system described above, Olmi explains that “the invention can also work with existing public transport such as buses, trains or trams, if they are fitted with communicator devices and computer processors.” (EX1005, 70.) “When a prospective passenger broadcasts his journey request (over the data transmission system), fixed-route transport vehicles in the vicinity of the passenger will receive his broadcast journey request, and their computer processors will calculate whether the passenger’s journey request is compatible with the itinerary of the transport vehicle.” (*Id.*) Thus, rather than match with a carpool driver with a fixed personal itinerary, a passenger may alternatively match with a public transport vehicle driver operating a fixed route vehicle itinerary. (*Id.*)

61. Accordingly, it is my opinion that a person of ordinary skill in the art would have understood that Olmi discloses a method of sharing transportation (e.g., by carpooling or existing public transport), where communication between passengers and drivers (e.g., to arrange rides) is performed through a central computer system (“shared transport system”) using mobile communicator devices operated by the passenger and driver (in the transit vehicle) (“entities of a shared transport system”).

62. It is my opinion that Olmi's system, as I discussed above, discloses a "shared transport system" under the Petitioners' proposed construction I was asked to consider. (See my discussion above in Section VII; *see also* my discussions above in Section VIII; *see also* my discussions below for limitation [1.a.ii] (my discussions relating to Petitioners' proposed construction of "transport provider" that I was asked to consider).)¹¹ For instance, for the reasons explained above and those summarized below, Olmi discloses:

¹¹ I have been informed that in district court that Patent Owner (PO) disagrees with Petitioners' proposed construction of the claimed "shared transport system" that I was asked to consider. I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss below) under the assumption that Petitioners' proposed construction is not applied to the claim term. Under that assumption, my opinions do not change in that Olmi as modified herein still discloses a "shared transport system" under any reasonable interpretation of the term consistent with the language of the claims of the '071 patent, its specification, and from my review of the prosecution history for the '071 patent, for the same reasons that I explain herein. Meaning, how the Olmi system and method (including as modified in light of Paul (and later below in view of Jarvinen)) still disclose the

“shared transport system”

“A server system”: For example, Olmi discloses a “single central controlling computer system” (which may be distributed processors) connected via a data transmission system. (EX1005, 13, 29-31.)

“that matches transport users with transport providers”: For example, Olmi’s controlling computer system “scans”/processes journey requests and selects transit vehicles/drivers to convey travelers. (*Id.*, Abstract; 15–18; 35–38; *see also* my discussion for element [1.a].)

“traveling an existing route”: In Olmi’s carpool configuration, drivers submit their intended itinerary/vehicle itinerary, and (alternatively) fixed-route public transport vehicles have fixed vehicle itineraries. (EX1005, 8, 11-12, 35, 70 (describing “fixed-route transport vehicles” and confirming a “passenger’s journey request is compatible with the itinerary of the transport vehicle”).)

claimed “shared transport system” in a manner consistent with and in context of the ’071 patent.

“shared transport system”

“defined before demand for transport”: Olmi discloses that the driver/vehicle itinerary information is submitted/stored in the system databases prior to matching and dispatch for a particular passenger request. (*Id.*, 32–36.)

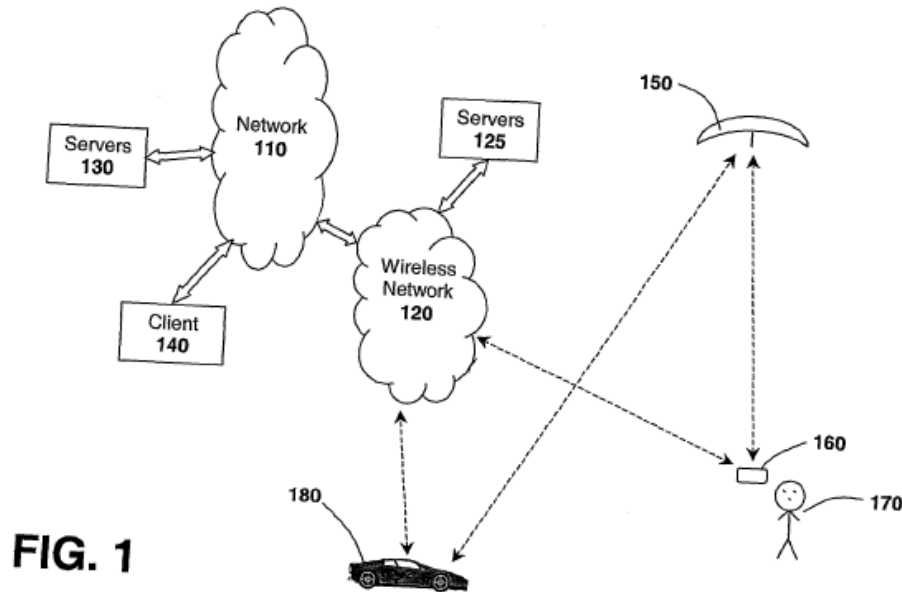
“independently of a transport user’s door-to-door trip”: In Olmi, the provider vehicle itinerary exists as provider-submitted itinerary commitments (or fixed vehicle itinerary) and is evaluated for compatibility with passenger requests rather than being created solely from the passenger’s request. (*Id.*, 11–12, 35–36, 70.)

63. Olmi also discloses that the communicator devices are “capable of two-way transmission of information (able to send data and receive data via the data transmission system).” (EX1005, 17; *see also id.*, 40 (“[C]ellular telephones make excellent communicator devices, since many of the latest models allow two-way transmission of text and graphical information.”).) Olmi also explains that “[i]f the passenger uses his cellular telephone as a communicator device, then it would be possible for the car pool driver to telephone the passenger in cases when the driver and passenger are unable to spot each other.” (*Id.*, 44.) Thus, in my opinion, a person of ordinary skill in the art would have understood *Olmi contemplates and*

suggests two-way exchange of messages between the passenger and driver's communicator devices. (See also *id.*, FIG. 7, 68-69 (describing a distributed embodiment where traveller communicator device 17 communicates with transit vehicle communicator devices 20, which confirms that the communicator devices in the central computer system arrangement (e.g., FIG. 6) are capable of sending and receiving communications between each other).)

64. Despite such teachings and suggestions, and although Olmi does not explicitly disclose the claimed “method of exchanging messages between entities of a shared transport system” in the context of the arrangements I discuss above, it is my opinion that a person of ordinary skill in the art would have been motivated to configure the Olmi system and process to implement such a feature based on the disclosures and suggestions of Paul (EX1006). I discuss Paul above (*see* my discussions above in Section VIII.B). Paul is similar to Olmi in that it discloses features relating to a method of arranging rideshares between passengers and drivers through a central computer system. Paul discloses a “computer-implemented method for providing transportation services” by matching a passenger's transportation request with a pickup vehicle. (EX1006, 2-3.) Paul's transportation ecosystem encompasses a “wireless communication network” that enables two or more users (e.g., potential passengers and drivers) to communicate using their

wireless devices (e.g., mobile phones) through network/data center servers. (*Id.*, 3-4, FIG. 1.)



(*Id.*, FIG. 1.)

65. The network/data center servers may encompass the servers of the wireless communication network, as well as the servers of a larger network (e.g., the Internet) that may be linked to the wireless communication network. (*Id.*, 3-5.) Paul further discloses that the network/data center servers act as a central computer system that connects potential passengers and drivers by receiving transportation requests from potential passengers, matching the passenger to a potential driver, and transmitting the request to that driver. (*Id.*, FIG. 2, 5, 7-8.) Thus, a person of ordinary skill in the art would have understood that Paul is similar to Olmi, which as I discussed above, also discloses a transportation ecosystem for arranging rides

between drivers and passengers by implementing a central computer system (similar to Paul's network/data center servers) that enables communication between the mobile devices of the passenger and driver. A person of ordinary skill in the art would have therefore had good reason to consider the disclosures of Paul when considering and implementing the Olmi system/method.

66. In reviewing Paul, a person of ordinary skill in the art would have understood that *Paul discloses a “method of exchanging messages” between the devices of a matched passenger and driver (“entities”)*. For example, Paul explains that after a driver accepts a passenger and the passenger confirms trip details (e.g., pickup location, price, etc.), the passenger and driver may communicate over the wireless network.

Once a driver has accepted, at 235 a message is transmitted to the user/passenger 170 confirming pickup location, time, a quoted price and/or the confirmation code for the driver. In one embodiment, the passenger 170 is then asked to confirm that these parameters are acceptable. If so, then the driver is notified of the confirmation. **At this stage, the passenger's cell phone (or other wireless device) number may be transmitted to the driver and/ or the driver's cell phone number may be transmitted to the passenger 170, so**

that the two can communicate directly over the wireless network 120.

(EX1006, 8.)¹²

67. Paul explains that phone numbers and other confidential information may be kept confidential by storing the contact/confidential information only at the data center, assigning each user a separate unique identifier, and coordinating communications through the network/data center servers (akin to Olmi's central computer system, i.e., the "shared transport system"). (*Id.*, 9 ("In one embodiment, **the passenger's and driver's cell phone numbers (and any other potentially confidential data) are kept only at the data center and communications coordinated through the data center.** In one embodiment, **the driver and passenger are each given a unique identifier separate from their cell phone number** or other wireless device.").)

68. Paul also discloses that this communication may involve, for example, a driver sending updates to the passenger on changes to arrival time or an indication that the driver has already arrived at the pickup point. (*Id.*, 9 ("The driver then proceeds to the pickup point. **As the driver continues on her way, she may update the passenger 170** of any changes to the arrival time estimate including, for

¹² As I explained, emphasis in this declaration is added unless I state otherwise.

example, the fact that she has arrived at the pickup point.”).) The passenger may also provide updates relating to cancellation, pickup time/location, or other itinerary changes. (*Id.*, 10 (“**While the passenger 170 waits for the transportation, she can notify the data center and/ or the driver** that she has decided to cancel the trip, change the pickup time, pickup location, and/ or any other changes to her itinerary.”).) Paul further discloses that the updates may be, for example, SMS (i.e., Short Message Service) messages (“messages”) exchanged between passenger and driver wireless devices (“exchanging messages between entities”) through the network/data center servers (“shared transport system”). For example, Paul discloses:

Alternatively, or in addition, **the updates may be comprised of a combination of both pull and push communications technology** (e.g. pull up to a fixed time before arrival then a push notification). In one particular embodiment, the pull mechanism is a periodic reference to an updated WAP page or Web page by the wireless device 160, and **the push mechanism is a Short Message Service (‘SMS’) message or pager notification transmitted by the server 125, 130 for wireless environments** and/ or an email or instant message for wired modes.

(*Id.*, 9.)

69. Therefore, in my opinion, a person of ordinary skill in the art would have understood that Paul discloses “[a] method of exchanging messages between entities of a shared transport system” similar to the features recited in this claim. (*See also* my discussions below for limitations [1.a]-[1.b].)

70. Based on the collective disclosures and suggestions from Olmi and Paul as I discuss above, it is my opinion that a person of ordinary skill in the art would have been motivated to configure the Olmi system and method (as I explain above) to provide features that result in the entities of Olmi’s shared transport system exchanging messages. For example, such a skilled person, based on their experience and knowledge, and the disclosures of Olmi in context of those of Paul, would have found it beneficial to configure the Olmi system to provide a messaging system in which a passenger and driver can communicate with each other to provide, for example, updates on pickup/arrival times, at a time after the passenger and driver have already been matched by the central computer system (consisting of network/data center servers) and even before the transport journey begins, consistent with the disclosures and guidance provided by Paul. (*See e.g.*, EX1006, 8.). A person of ordinary skill in the art would have been motivated to implement such features in Olmi for reasons similar to those I discuss below for limitation [1.b]. (*See* my discussion and reasons for combining the teachings/features of Olmi and Paul to configure the Olmi system/method to provide message communications (via a proxy

message system), which are applicable and incorporated here in support of this modification to the Olmi system/method.) For instance, in my opinion, a person of ordinary skill in the art would have been motivated to include message exchange features similar to those disclosed by Paul (as I discuss here and below for limitation [1.b]) when implementing the Olmi system/method in order to provide a messaging communication system that allows for more robust, direct, and secure communication between a passenger and driver in the shared transport system arrangement I discuss above. Such a skilled person would have recognized and appreciated that Olmi recognized that there are several instances where a passenger and driver may need to communicate directly with each other, including a “car pool driver...telephon[ing] the passenger in cases when the driver and passenger are unable to spot each other” at pick-up (EX1005, 44), or “[i]n the case of lost property left in a car pool vehicle,” a passenger/driver may “obtain the email address or telephone number of the appropriate driver or passenger” from the controlling computer system logs (*id.*, 84).

71. Although Olmi’s method discloses that the passenger and driver may use personal phone numbers to communicate with each other by phone, I explain further below for limitation [1.b] why such a person of ordinary skill in the art would have been motivated to implement features like those disclosed by Paul to provide a “proxy messaging system” that facilitates the exchange of messages between the

passenger and driver, which are applicable for this discussed configuration of Olmi. As I discuss below for limitation [1.b], Paul discloses an intermediary (proxy) communication system, which allows for phone numbers and other confidential information to be kept only at the central data center, and this system would have been advantageous because it would have allowed for increased user privacy and thus enhanced safety. (*See e.g.*, EX1006, 8-10.) A person of ordinary skill in the art would have understood that having features like that disclosed by Paul's intermediary (proxy) communication system would have improved user convenience and system efficiency in Olmi's system and method discussed above and below for the other limitations of this claim by allowing for passengers and drivers to communicate through the same platform through which ride requests are sent and received.

72. Based on their experience and knowledge, and the collective disclosures and suggestions in Olmi and Paul, it is my opinion that a person of ordinary skill in the art would have been motivated to implement, and would have had a reasonable expectation of success in implementing, such a modification to Olmi's system/process such that the Olmi-Paul system/method as configured would operate successfully and as intended to facilitate message communications between the passenger and driver in the Olmi shared transport system. For example, such a skilled person would have recognized that such an implementation would have

leveraged existing technologies (like the communicator devices already implemented for Olmi's shared transport system and method) and transportation service communications systems (like those disclosed by Paul) according to known techniques (e.g., known communication technology described by Paul and Olmi). Such a modification would have predictably resulted in a modified Olmi-Paul system/process in which a shared transport system (e.g., in a carpooling or public transport configuration) is configured to allow for the passenger and driver to exchange messages, via a central computer system (e.g., consisting of network/data center servers), using their mobile devices ("[a] method of exchanging messages between entities of a shared transport system").

ii) [1.a] identifying, by the share transport system, a transport user and a transport provider based on:¹³

73. In my opinion Olmi (including as modified above in view of the disclosures of Paul) discloses and/or suggests this limitation. My analysis above for limitation [1.pre] and those I provide further below for limitations [1.a.i]-[1.a.ii] explains how Olmi discloses that the central computer system ("share[d] transport

¹³ I was asked to assume that the "share transport system" as written in limitation [1.a] refers to the "shared transport system" that is recited in limitation [1.pre]. I applied my analysis based on this assumption.

system”) identifies a potential passenger (“transport user”) based on receipt of a journey request (“identifying, by the share[d] transport system, a transport user”) and then identifies a driver (“transport provider”) to comply with the journey request (“identifying, by the share[d] transport system,..., a transport provider”) based on criteria such as the proximity of the vehicle to the passenger, the seats available and number of passengers requesting rides, and the type of transit vehicle. (See my discussions above for limitation [1.pre] and those below for limitations [1.a.1]-[1.a.ii]; see also my discussions of Olmi in Section VIII.A; EX1005, 15, 18, 32.)

74. In my opinion, *Olmi discloses that the driver is a “transport provider” under Petitioners’ proposed construction* that I was asked to consider. (See my discussions in Section VII.)¹⁴ For instance, for the reasons explained above and those summarized below, Olmi discloses:

¹⁴ I have been informed that in district court that Patent Owner (PO) disagrees with Petitioners’ proposed construction of the claimed “transport provider” that I was asked to consider. I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss below) under the assumption that Petitioners’ proposed construction is not applied to the claim term. Under that assumption, my opinions do not change in that Olmi as modified herein still

“transport provider”

“A driver offering transport along an existing route”: In Olmi’s carpool configuration, drivers submit their intended itinerary/vehicle itinerary, and (alternatively) fixed-route public transport vehicles have fixed vehicle itineraries. (EX1005, 8, 11-12, 35, 70.)

“and defined before demand for transport”: Olmi discloses that the driver/vehicle itinerary information is submitted/stored in the system databases prior to matching and dispatch for a particular passenger request. (*Id*, 8, 11-12, 32-36, 70.)

“independently of a transport user’s door-to-door trip”: In Olmi, the provider vehicle itinerary exists as provider-submitted itinerary commitments (or fixed

discloses a “transport provider” under any reasonable interpretation of the term consistent with the language of the claims of the ’071 patent, its specification, and from my review of the prosecution history for the ’071 patent, for the same reasons that I explain herein. Meaning, how the Olmi system and method (As modified in light of Paul (and later below in view of Jarvinen) still disclose the driver as a “transport provider” in a manner consistent with and in context of the ’071 patent.

“transport provider”

vehicle itinerary) and is evaluated for compatibility with passenger requests rather than being created solely from the passenger’s request. (*Id.*, 11–12, 35–36, 70; *see also* my discussions above in Sections VII, VIII.A, and for limitation [1.pre].)

- (1) **[1.a.i] receiving, by the shared transport system, a transport request from a transport user device of a transport user, wherein the transport request includes a pick-up location; and**

75. In my opinion, Olmi, including as modified above, discloses this limitation. For example, in addition to and consistent with the disclosures I discuss above for limitations [1.pre]-[1.a] and in Section VIII.A, Olmi discloses that the controlling computer system receives (“receiving, by the shared transport system”) a journey request (“a transport request”) from a potential passenger’s mobile communicator device (“from a transport user device of a transport user”). For example, Olmi discloses:

This invention provides a traveller transportation system operating on the roads in which **travellers use communicator devices to send their journey requests,** and any car pool vehicle drivers use communicator devices to send their car pool intended itinerary specifications, **to a controlling computer system....**

(EX1005, 15.) (*See also id.*, 18 (“Preferably this invention will rapidly process incoming journey requests, so that **when a prospective traveller submits a journey request on his communicator device, the controlling computer system will marshal a fast response** that has a transit vehicle arrive to collect the traveller and convey him along his specified itinerary typically within minutes....”), 32 (“[A] **prospective traveller 19 uses a communicator device 17 to formulate and send**

his journey request to a central controlling computer system 15 via the data transmission system 16....”).) Olmi explains that a “journey request is defined as a data structure or a computer data format which includes a specification of a traveller or passenger itinerary.” (*Id.*, 12.)

76. Moreover, a person of ordinary skill in the art would have recognized that, as shown in Figure 8 of Olmi below, the journey request includes traveller itinerary information, such as “From” and “To” information corresponding to the traveller’s requested trip. Olmi explains that the data in an incoming journey request is stored as a journey request record having six data fields, including “[t]he specification of the itinerary of the traveller,” which “will include the current location or desired pick-up point for the traveller” (“wherein the transport request includes a pick-up location”). (*Id.*, 32.)

Traveller Journey Request
From: 263 Kensington High Street
To: 116 Upper Street N1 1AE
Transit Vehicle: Taxibus or Car Pool
Passengers: 1
Departure Time: Immediate
Prioritise: Speed of Response

(*Id.*, FIG. 8 (excerpted and annotated); *see also id.*, 29 (“Figure 8 shows part of the sequence of user-interface events on the text display screen of a communicator device when a passenger submits a journey request to the controlling computer system...”), 32, 43 (“For passengers using communicator devices that have built-in electronic positioning functionality, the controlling computer system can automatically determine their current location address. However, passengers using communicator devices that do not have built-in electronic positioning functionality must manually specify their current location address.”).)

77. Olmi explains that “preferably this invention will operate using pre-defined passenger pick-up (and optionally set down) points, each with a unique pick-up point reference code, in order to eliminate passenger pick-up point ambiguity.” (*Id.*, 17.)

78. Accordingly, in my opinion, Olmi discloses “receiving, by the shared transport system, a transport request from a transport user device of a transport user, wherein the transport request includes a pick-up location” as recited in this claim. A person of ordinary skill in the art would have understood that such features would have been implemented in the Olmi-Paul modified system and method that I discuss above for the reasons discussed above here and for limitations [1.pre]-[1.a], which I incorporate here. Thus, in my opinion, the Olmi-Paul combination discloses or suggests this limitation.

79. In my opinion, Olmi (and consequently, for reasons above, the Olmi-Paul combination) *discloses that a predefined passenger pick-up point included in a passenger's journey request is a "pick-up location" under Petitioners' proposed construction* that I was asked to consider.¹⁵ (See my discussions above in Section VII.)

¹⁵ I have been informed that in district court that Patent Owner (PO) disagrees with Petitioners' proposed construction of the claimed "pick-up location" that I was asked to consider. I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss below) under the assumption that Petitioners' proposed construction is not applied to the claim term. Under that assumption, my opinions do not change in that Olmi as modified herein still discloses a "pick-up location" under any reasonable interpretation of the term consistent with the language of the claims of the '071 patent, its specification, and from my review of the prosecution history for the '071 patent, for the same reasons that I explain herein. Meaning, how the Olmi system and method (As modified in light of Paul (and later below in view of Jarvinen) still discloses the "pick-up location" in a manner consistent with and in context of the '071 patent.

“pick-up location”

“A node along an existing route”: As I discussed above, in Olmi, a passenger’s journey request includes the passenger’s itinerary, which includes the desired pick-up point of the passenger. (EX1005, 32.) Olmi also discloses that “using the terminology of graph theory, most traveller or passenger itineraries can be encoded as a directed graph whose vertices are the embarkation and disembarkation points of the itinerary, and whose directed edges indicate the direction of travel.” (*Id.*, 11.) A person of ordinary skill in the art would have understood that each of these vertices, including the pick-up point, is a “node” along an existing route. Moreover, this pick-up/embarkation point may be along a carpool or public transport driver’s predetermined/fixed route. (*Id.*) For example, Olmi explains that “travellers [passengers or carpool drivers] that have identical pick-up or drop-off points” can be “plac[ed]...on the same transit vehicle.” (EX1005, 74.) Thus, in the carpool context, a potential passenger’s pick-up point may be a node along a predetermined route of a carpool driver.

“defined before demand for transport and independently of a transport user’s door-to-door trip”: In the public transport context, Olmi explains that a passenger’s pick-up point may be an “embarkation point such as a bus stop”

<p style="text-align: center;"><u>“pick-up location”</u></p>
<p>along the public transport fixed route. (EX1005, 70.) As described for limitation [1.pre], each of these predetermined/fixed routes is “an existing route defined before demand for transport and independently of a transport user’s door-to-door trip.” (See my discussions above for limitation [1.pre].)</p>

Accordingly, Olmi discloses that a passenger’s pick-up point may be “[a] node along an existing route defined before demand for transport and independently of a transport user’s door-to-door trip” consistent with the construction I was asked to consider and consistent with the “pick-up location” described in the ’071 patent.

(2) [1.a.ii] determining, by the shared transport system, a transport provider device of a transport provider in proximity to the pick-up location received in the transport request; and

80. In my opinion, Olmi, including as modified above, discloses/suggests this limitation for the reasons discussed above for limitations [1.pre]-[1.a.i] and those below.

81. For example, my discussion above for limitation [1.a.i] explains how in Olmi, including as modified in view of Paul, a potential passenger uses their mobile communicator device to submit a journey request (“transport request”) to the controlling computer system, where the journey request is a data structure that

indicates the pick-up location of the passenger (“pick-up location received in the transport request”). (See my discussions above for limitations [1.a.i].) Olmi explains that “[t]he data in each such incoming journey request is stored as a journey request record in the journey requests database” of the controlling computer system. (EX1005, 32.) Also that, “[i]n addition to the journey requests database, the controlling computer system also maintains a transit vehicle current itineraries database.” (*Id.*, 34.) A person of ordinary skill in the art would have recognized from Olmi’s disclosures that this database “contains a data record, which we shall call the transit vehicle record, for each currently operational transit vehicle,” i.e., “a vehicle that is currently conveying travellers, or a vehicle that is currently empty but is ready to convey travellers.” (*Id.*) Also, Olmi explains that “[t]he format of the transit vehicle record includes” data fields such as “[t]he current geographic position of the transit vehicle” and “[t]he current vehicle itinerary of the transit vehicle.” (*Id.*) Olmi continues in explaining that, “[w]hen a driver of a car pool vehicle wants to make himself available for car pooling, he will use the communicator device in his vehicle to submit his car pool intended itinerary specification, via the data transmission system 16, to the controlling computer system 15, and these details are stored in the transit vehicle current itineraries database” and also “entered in the journey request database as a journey request record, with a relational link set up from this transit vehicle record to this journey request record...because [the carpool

driver] is also a traveller, and his personal itinerary forms part of the itinerary commitments of his vehicle.” (*Id.*, 35; *see also id.*, 15 (“[A]ny **car pool vehicle drivers use communicator devices to send their car pool intended itinerary specifications, to a controlling computer system** wherein: an intelligent grouping module intelligently groups the said travellers into transit vehicles...”), 32 (“[T]ravellers who are **car pool vehicle drivers will use a communicator device to submit their car pool intended itinerary specification to the controlling computer system....**”).) As disclosed by Olmi, this “vehicle itinerary will comprise a set of prescribed geographic points or addresses to which the vehicle must navigate in a prescribed order.” (*Id.*, 11-12; *see also id.*, 16.)

82. Olmi further discloses that the controlling computer system includes an “intelligent grouping module,” which is a data-processing module used to intelligently group passengers with drivers in transit vehicles. (EX1005, 13-14.) For instance, Olmi describes a process by which the intelligent grouping module groups passengers with drivers using criteria such as the “**transit vehicle [being] within the vicinity of the traveller’s current location or embarkation pick-up point as specified in the journey request record**” (“transport provider in proximity to the pick-up location received in the transport request”), the “transit vehicle [having] a sufficient quantity of available passenger places for the number of travellers

specified in his journey request,” and the ”transit vehicle is of the type specified in this journey request,” among other criteria. (*Id.*, 35-36.)

83. Olmi explains that “[p]referably the intelligent grouping module will take into account **transit vehicle proximity to the prospective traveller**” (“transport provider in proximity to the pick-up location received in the transport request”). (*Id.*, 18.) Olmi clarifies that,

This means that when trying to place a new traveller into a transit vehicle, not only will the intelligent grouping module seek a vehicle with a good itinerary compatibility to the traveller, **the module will also try to find a transit vehicle that is currently located in the vicinity of that traveller**, enabling the transit vehicle to get to the traveller’s pick-up point quickly.

(*Id.*; see also *id.*, 15 (“[T]he said intelligent grouping module operating with the aid of data from an electronic positioning system detailing the current geographic position of each of the said transit vehicles.”), 43 (“[T]he **intelligent grouping module will begin searching the transit vehicle current itineraries database for a suitable car pool vehicle, seeking one that is close to the passenger** (a few minutes drive away), and with itinerary commitments that can easily accommodate the passenger’s desired destination (that is to say, with itinerary commitments that are compatible with the passenger’s itinerary), 70 (“When a prospective passenger

broadcasts his journey request (over the data transmission system), **fixed-route transport vehicles in the vicinity of the passenger will receive his broadcast journey request**, and their computer processors will calculate whether the passenger's journey request is compatible with the itinerary of the transport vehicle.”.)

84. Olmi also explains that when one or more suitable transit vehicles are identified, the central computer system sends details of the transit vehicle(s) to the passenger's communicator device. (*Id.*, 37-38 (“When the intelligent grouping module has selected a suitable transit vehicle into which the traveller 19 can be intelligently grouped according to his journey request, **details of this transit vehicle are sent to the traveller's communicator device 17.**”), 43 (“As soon as a suitable car pool vehicle is found, the controlling computer system provides details to the passenger....Should the controlling computer system find more than one suitable car pool option, **a list of the suitable vehicles will be detailed on the passenger's communicator device.**”).) “The passenger then simply selects any vehicle from the list in order to proceed with the car pool trip.” (*Id.*, 43.) “As soon as the passenger selects a car pool vehicle from the list, the controlling computer system will send a message to that vehicle's communicator device, requesting the driver to convey this passenger.” (*Id.*) Olmi further discloses that upon receiving the passenger's selection, the controlling computer system identifies the selected

vehicle's in-vehicle communicator device ("the transport provider device") and transmits the request to that device. (EX1005, 43; *see also id.*, 37–38.) And once the central computer system has determined which suitable vehicle and corresponding driver has been selected ("determining, by the shared transport system, a transport provider device of a transport provider") and sent the message to the driver's in-vehicle communicator device, "[t]he driver can accept this journey by pressing the appropriate key or button on his communicator device." (*Id.*)

85. Therefore, it is my opinion that Olmi discloses that the intelligent grouping module is used to determine an appropriate transport vehicle (which contains a communicator device (*see my discussions above for limitation [1.a]-[1.a.i]*) for a passenger ("determining, by the shared transport system, a transport provider device of a transport provider") based on the proximity of the transit vehicle/included communicator device to the pick-up location received in the passenger's journey request ("in proximity to the pick-up location received in the transport request").

86. A person of ordinary skill in the art would have understood that the Olmi-Paul system and method I discuss above for this claim would have incorporated and implemented, and would have been motivated to implement in such modified system and method, the features discussed above from Olmi for the reasons I discuss above for this limitation and those above for limitations [1.pre]-[1.a.i].

iii) [1.b] upon identifying, by the shared transport system, the transport user and the transport provider, and at a time before or after transport of the transport user by the transport provider:

87. In my opinion, Olmi, including as modified above, discloses or suggests this limitation for reasons I discuss above for limitations [1.pre]-[1.a.ii] and those below for this limitation. For example, my discussions for limitation [1.pre] and further below for limitations [1.b.i]-[1.b.iii] (which I incorporate and reference here) explain how the Olmi-Paul system/method incorporates a messaging system in which a passenger and driver can communicate with each other to provide, e.g., updates on pickup/arrival times, at a time after the passenger and driver have already been matched by the central computer system (consisting of network/data center servers) (“upon identifying, by the shared transport system, the transport user and the transport provider”), but before the transport journey begins (“and at a time before...transport of the transport user by the transport provider”). For instance, Paul explains that,

“[o]nce a driver has accepted, at 235 a message is transmitted to the user/passenger 170 confirming pickup location, time, a quoted price and/or the confirmation code for the driver. In one embodiment, the passenger 170 is then asked to confirm that these parameters are acceptable. If so, then the driver is notified of the confirmation. At this stage, **the passenger’s cell phone (or other wireless**

**device) number may be transmitted to the driver and/
or the driver's cell phone number may be transmitted
to the passenger 170, so that the two can communicate
directly over the wireless network 120.**

88. (EX1006, 8.) (*See also id.*, 9 (“The driver then proceeds to the pickup point. **As the driver continues on her way, she may update the passenger 170** of any changes to the arrival time estimate including, for example, the fact that she has arrived at the pickup point.”), 10 (“**While the passenger 170 waits for the transportation, she can notify the data center and/ or the driver** that she has decided to cancel the trip, change the pickup time, pickup location, and/ or any other changes to her itinerary.”).)

89. Accordingly, it is my opinion that the Olmi-Paul combination discloses and/or suggests this limitation.

- (1) **[1.b.i] receiving, by a proxy messaging system, a first message from a sender device of a sender, wherein the sender is one of the transport user and the transport provider, and the proxy messaging system is part of the shared transport system;**

90. In my opinion, Olmi, including as modified above, discloses or suggests this limitation for reasons explained above for limitations [1.pre]-[1.b] and those below for this limitation. Accordingly, the Olmi-Paul combination discloses/suggests this limitation.

91. For example, in addition to the reasons I discuss above (*see* my discussions in my discussions above for limitation [1.b]), the Olmi-Paul combination discloses/suggests “a first message from a sender device of a sender, wherein the sender is one of the transport user and the transport provider.” As I discussed for limitation [1.pre], the Olmi-Paul method/system allows for communication between the passenger and driver in light of the disclosures from Paul in context of Olmi, where either user (“wherein the sender is one of the transport user and the transport provider”) may send a message (e.g., via SMS) (“a first message”) from the user’s wireless device (“from a sender device of a sender”) to provide updates on arrival/pickup time, location, cancellations, or other itinerary changes. (*See e.g.*, EX1006, 8 (“[T]he **passenger’s cell phone (or other wireless device)** number may be transmitted to the driver and/ or the **driver’s cell phone** number may be transmitted to the passenger 170, so that **the two can communicate directly over the wireless network 120.**”), 9 (“The driver then proceeds to the pickup point. **As the driver continues on her way, she may update the passenger 170** of any changes to the arrival time estimate including, for example, the fact that she has arrived at the pickup point.”), 10 (“**While the passenger 170 waits for the transportation, she can notify the data center and/ or the driver** that she has decided to cancel the trip, change the pickup time, pickup location, and/ or any other changes to her itinerary.”); *see also id.*, 9 (“Alternatively, or in addition, **the updates**

may be comprised of a combination of both pull and push communications technology (e.g. pull up to a fixed time before arrival then a push notification). In one particular embodiment, the pull mechanism is a periodic reference to an updated WAP page or Web page by the wireless device 160, and **the push mechanism is a Short Message Service (‘SMS’) message or pager notification transmitted by the server 125, 130 for wireless environments** and/ or an email or instant message for wired modes.”); *see also* my discussions above in Sections VIII.A-B, and for limitations [1.pre]-[1.b].)

92. Additionally, the Olmi-Paul combination discloses/suggests “receiving, by a proxy messaging system” (EX1006, 8-10) the first message as I discussed above, where “the proxy messaging system is part of the shared transport system” (EX1006, 4-5, 9; EX1005, 13-15, 31, 43-44, 87) based on the teachings of Paul. (*See also* my discussions above in Sections IX.A.4.i and IX.A.4.iii.) A person of ordinary skill in the art would have had good reason and been motivated to include features similar to those disclosed by Paul when implementing the Olmi system/method in order to provide a proxy messaging communication system that allows for more robust, direct, and secure communication between a passenger and driver, beyond the sending and receipt of transportation requests. Paul teaches that rider-driver communications may be coordinated through the data center, with confidential contact information kept only at the data center and updates conveyed

through server-mediated push/pull communications. (EX1006, 8-10.) In the Olmi-Paul combination, the central computer system (consisting of network/data center servers) ("shared transport system") employs a communication system ("proxy messaging system") that allows for a passenger and driver's phone numbers (and other confidential information) to be kept confidential by storing the contact/confidential information only at the data center, assigning each user a separate unique identifier, and coordinating communications through the central computer system ("proxy messaging system is part of the shared transport system"). (EX1005, 13-15, 31, 43-44, 87; EX1006, 8-10.) For instance, a person of ordinary skill in the art would have recognized that Paul discloses in one embodiment, **"the passenger's and driver's cell phone numbers (and any other potentially confidential data) are kept only at the data center and communications coordinated through the data center. In one embodiment, the driver and passenger are each given a unique identifier separate from their cell phone number or other wireless device."** (EX1006, 9.) Such features would have been leveraged and implemented with similar functionalities in the Olmi-Paul system and method for the reasons I discuss above here and for limitations [1.pre]-[1.b].

93. As I explained above, a person of ordinary skill in the art would have recognized and appreciated that Olmi discloses that there are several instances where a passenger and driver may need to communicate directly with each other, including

a “car pool driver...telephon[ing] the passenger in cases when the driver and passenger are unable to spot each other” at pick-up (EX1005, 44), or “[i]n the case of lost property left in a car pool vehicle,” a passenger/driver may “obtain the email address or telephone number of the appropriate driver or passenger” from the controlling computer system logs (*id.*, 84). Olmi’s method does not specify using a “proxy messaging system” between the passenger and driver but instead discloses that the passenger and driver may use personal phone numbers to communicate with each other by phone. Thus, a person of ordinary skill in the art would have recognized that Paul’s proxy communication system, which allows for phone numbers and other confidential information to be kept only at the central data center, would have been advantageous because it would have allowed for increased user privacy and thus enhanced safety. (EX1006, 8-9.) Paul contemplates this communication functionality as part of the same transportation-service workflow: after the data center sends pickup confirmation, the passenger’s and driver’s phone numbers may be shared so they can communicate directly, or, alternatively, those phone numbers may be kept only at the data center and communications coordinated through the data center. (EX1006, 8-9.) A person of ordinary skill in the art likewise would have found it straightforward to implement that proxy communication functionality within Olmi’s central controlling computer system, because Olmi already discloses a single central controlling computer system having two-way data

exchange with passenger and driver communicator devices and already contemplates passenger-driver communications and communication-related events as part of that same system. (EX1005, 31, 44, 84, 87.) Moreover, a person of ordinary skill in the art would have understood that Paul's proxy communication system would have improved user convenience and system efficiency by allowing for passengers and drivers to communicate through the same platform through which ride requests are sent and received.

94. In my opinion, a person of ordinary skill in the art would have had good reason to implement, and would have had a reasonable expectation of success in implementing, such a modification to Olmi's system/process, especially given it would have involved the application of known technologies (e.g., known shared transport systems and use of communicator devices (like those disclosed by Olmi) and transportation service communications systems (like those disclosed by Paul)) according to known techniques (e.g., known communication technology like that disclosed by Paul and Olmi)). Such a modification would have predictably resulted in a modified Olmi-Paul system/process in which a shared transport system (e.g., in a carpooling or public transport configuration) is configured to allow for the passenger and driver to exchange messages, via a central computer system (e.g., consisting of network/data center servers), using their mobile devices ("[a] method

of exchanging messages between entities of a shared transport system”). (See also my discussions above for limitations [1.pre]-[1.a.ii].)

95. In my opinion, a person of ordinary skill in the art would have understood that the central computer system (consisting of network/data center servers), and processes performed by such system, operate as a “proxy” between the passenger and driver by acting as an intermediary between the two users. A person of ordinary skill in the art would have also understood that when messages from a sender, such as the “first message” described above, are coordinated through the central computer system (consisting of network/data center servers), the messages are first sent to the communication system of the central computer system (“receiving, by a proxy messaging system, a first message... the proxy messaging system is part of the shared transport system”). (EX1005, 29-31; EX1006, 8-10.) Paul explains that after a driver sends an arrival time update (“a first message from a sender device of a sender, wherein the sender is...the transport provider”), the update may be conveyed to the passenger from the network/data center server by pull or push transmission. (EX1006, 9 (“**The driver then proceeds to the pickup point. As the driver continues on her way, she may update the passenger 170 of any changes to the arrival time estimate** including, for example, the fact that she has arrived at the pickup point. These updates can be in the form of either a ‘pull’ transmission (e.g., wherein the **passenger’s wireless device 160 periodically polls**

the server 125 or 130 for a pickup update) or a ‘push’ transmission (e.g., wherein **the server 125 or 130 automatically transmits an update to the wireless device;** or, alternatively, wherein a confirmation telephone call is placed to the passenger).”).) Paul thus teaches server-mediated coordination of rider-driver communications. (EX1006, 8-10.) And Olmi teaches that the shared transport system already includes a central controlling computer system with two-way data exchange to passenger and driver communicator devices. (EX1005, 29-31.) A person of ordinary skill in the art would have thus understood that for the sender’s message to be eventually received by the recipient *via the central computer system*, the sender’s original message (“first message”) would have been initially received by the communication system operated by, and part of, the central computer system (“receiving, by a proxy messaging system, a first message from a sender device of a sender”).

96. Further, a person of ordinary skill in the art would have been motivated to implement the Olmi-Paul system/method such that, when a sender sends a message from the sender’s wireless device, the message is first received by the central computer system, which implements a communication system (“proxy messaging system”) that coordinates communications through the data center, consistent with Paul’s teachings. (EX1006, 8-9.) A person of ordinary skill in the art would have had good reason to configure the Olmi-Paul system/method (as I

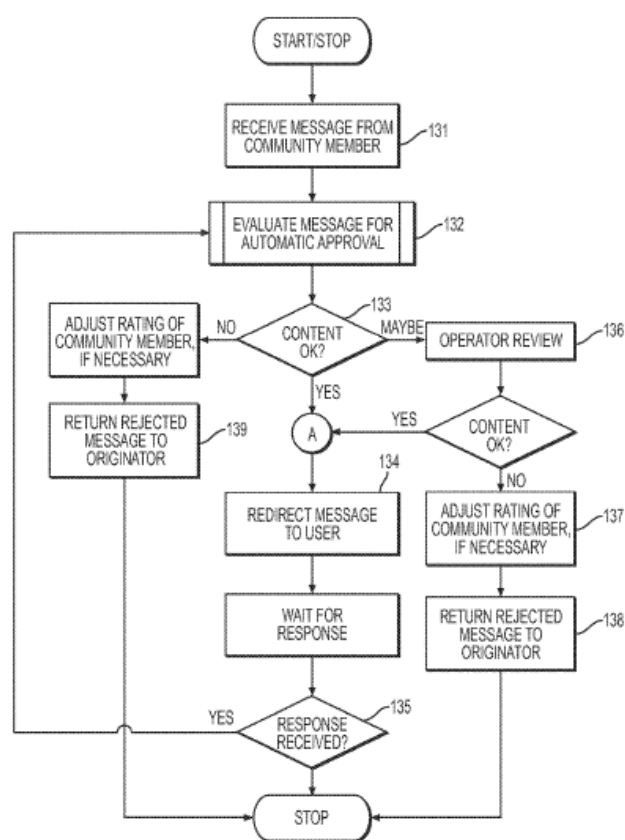
discussed above for limitations [1.pre]-[1.a]) such that the central computer system would be configured to use such a communication system (as a proxy messaging system) to forward messages (e.g., transportation requests, updates to existing transportation journeys, etc.) received from one passenger/driver device to the other of the driver/passenger devices (i.e., the recipient device) in a manner similar to the features discussed above by Paul. (EX1005, 29-31, 43-44, 84; EX1006, 8-9; *see also* my discussions above in Sections IX.A.4.i and IX.A.4.iii.) Accordingly, a person of ordinary skill in the art would have had good reason to leverage Paul's teachings to configure the Olmi system/method such that the central computer system uses a communication system, as a proxy messaging system, to receive a message from one passenger/driver device and forward that message to the other driver/passenger device.

97. Based on their knowledge and experience in context of the collective disclosures of Olmi and Paul, it is my opinion that a person of ordinary skill in the art would have recognized the advantages of such an implementation (as I discuss above) consistent with those expressly contemplated by Paul, such as to allow users to exchange messages while keeping phone numbers and other user information confidential, as I discussed above. (EX1006, 9.) Recognizing such benefits, and the teachings/suggestions provided by Paul's disclosure, a person of ordinary skill in the art would have been motivated to implement the features in the above discussed

modification to the Olmi-Paul system/method. A person of ordinary skill in the art would have had a reasonable expectation of success in implementing such a modification to the Olmi-Paul system/process based on their knowledge and experience in context of the disclosures of Olmi and Paul. For example, such modification and configuration would have involved the application of known technologies (e.g., known rideshare communication systems that coordinate communication through a central computer system or network/data center servers (Olmi, Paul)) according to known techniques (e.g., known methods of proxy communication to maintain user anonymity (Paul)). A person of ordinary skill in the art would have had the skills, knowledge, and capabilities to implement such a modification using the disclosed features of Paul in context of their state of the art knowledge, including, e.g., software programming and related component design and development skills that would facilitate the messaging functions taught/suggested by Paul. In my opinion, such an implementation would have been foreseeable and predictably resulted in the Olmi-Paul system/method performing processes that include “receiving, by a proxy messaging system, a first message from a sender device of a sender, wherein the sender is one of the transport user and the transport provider, and the proxy messaging system is part of the shared transport system,” as claimed.

98. For example, a person of ordinary skill in the art would have appreciated that the Olmi-Paul system/method discloses/suggests a proxy messaging system (and related operations) in a manner consistent with the '071 patent. Namely, the specification and figures of the '071 patent do not describe a proxy messaging system but rather refer to a process flow when discussing proxy messaging. (EX1001, 13:13-54; *e.g., id.*, 13:25-31 (“FIG. 13 shows a message proxy **system** ...” and “the **system** would function as illustrated in FIG. 13”), FIG. 13 (below).)

FIGURE 13. TRANSPORT COMMUNITY PROXY MESSAGE SERVICE



99. The Olmi-Paul system/method discloses/suggests the claimed “proxy messaging system” in a similar fashion because as I explained above, the central

computer system (consisting of network/data center servers) of the Olmi-Paul system/method would have included a communication system that performs functions just like that claimed.

- (2) **[1.b.ii] generating, by the proxy messaging system, a second message, wherein the second message comprises contents of the first message and a first unique identifier associated with the sender; and**

100. In my opinion, Olmi, in view of Paul and Jarvinen, discloses/suggests this limitation.

101. As I discussed for limitation [1.b.i], the Olmi-Paul system/method discloses/suggests that the “proxy messaging system” allows for a passenger and driver’s phone numbers (and other confidential information) to be kept confidential by storing the contact/confidential information only at the data center, assigning each user a separate unique identifier (“a first unique identifier associated with the sender”), and coordinating communications through the central computer system (consisting of network/data center servers). (EX1006, 9 (“In one embodiment, the **passenger’s and driver’s cell phone numbers (and any other potentially confidential data) are kept only at the data center and communications coordinated through the data center. In one embodiment, the driver and passenger are each given a unique identifier separate from their cell phone number** or other wireless device.”).) As I further discussed for limitation [1.b.i],

the Olmi-Paul system/method discloses/suggests that the central computer system's proxy messaging system transmits the sender's update/message to the recipient.

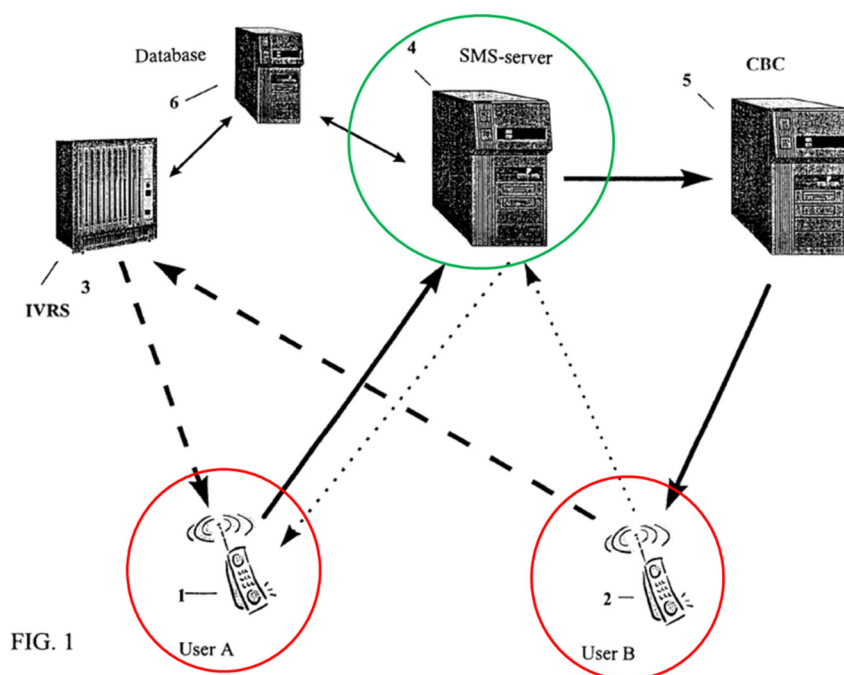
102. While neither Olmi nor Paul explicitly disclose that this transmission involves “generating, by the proxy messaging system, a second message, wherein the second message comprises contents of the first message and a first unique identifier associated with the sender,” it is my opinion that a person of ordinary skill in the art would have been motivated to implement such features in the Olmi-Paul system/method in view of the disclosures and suggestions provided by Jarvinen.

103. Jarvinen relates to a method that provides for two-way communication between mobile devices (similar to the features provided by the Olmi-Paul combination), and similar to the features disclosed by Paul, Jarvinen specifically relates to a method of implementing a proxy messaging system. For example, Jarvinen discloses a “method for transmitting a message in a communications service operating through a mobile telephone network.” (EX1007, Abstract.) “The communications service may be, for example, a chat line” which is “implemented in Internet and telephone applications.” (*Id.*, 1:5-6.) Jarvinen explains that its method and system are implemented via a CHAT2000 program that operates on a conventional mobile telephone. (*Id.*, 3:1-3 (“According to Figure 1, user 1 boots the CHAT2000 program in the terminal device. In a conventional mobile telephone, this program can be implemented using, for instance, the SIM Application Tool Kit,

WAP, or in some corresponding manner.”.) Jarvinen explains that “[u]sers can communicate with others who are logged on as users of the system, whenever their terminal device is in the operating area of the mobile telephone network.” (*Id.*, 2:17-18.)

104. In Jarvinen’s system, a customer addresses a message to at least one other customer, with the message being routed through an SMS server before eventually reaching the intended customer recipient. (*Id.*, Abstract (“[A] **message addressed to at least one other customer (2) is received from a first customer (1), ...and the message...[is] forwarded to at least one other customer** of the communications service.”), 4:5-10 (“When using a short text message to respond, **user 2 writes their response and sends it as a short text message to user 1, who sent the original message.** In this case, the responding user 2 selects the recipient’s CHAT2000 ID as the destination number for the message. **When it receives the message, SMS centre 4 checks the database to find the actual telephone number corresponding to the recipient’s CHAT2000 ID, and routes the short text message to that number.**”), 4:26-27 (“A message is received from a first customer 1, addressed to at least one second customer 2. This message may be, e.g., a GSM short text message.”), 4:28-5:7 (discussing “[c]ustomer 1...who has sent the message” and the message being “forwarded to at least one second customer 2 of the communications service”).) Figure 1 (annotated below) shows how

communication between users' mobile devices (in red) is routed through the SMS server (in green) consistent with how a person of ordinary skill in the art would have understood Jarvinen's disclosures.



(*Id.*, FIG. 1 (annotated); *see also id.*, 2:6-12 (explaining how “GSM or other short text messages are sent” and “an SMS server routes the incoming short text messages to a separate database” and the “system then forwards the short text message from the database to...one or more cells of the mobile telephone network”), 3:5-7 (“User 1 writes the desired notice using the CHAT2000 program and sends it as a short text message to SMS server 4.”), 3:22-25 (“...SMS server 4 forwards the notice to Cell Broadcast Centre (CBC) 5, which transmits the notice as a cell broadcast to...one or

more cells of the mobile telephone network.”), 4:3-4 (“User 2 can now, if they wish, respond to the notice, either with a short text message or by phoning.”).)

105. A person of ordinary skill in the art would have recognized and appreciated that Jarvinen discloses features similar to Olmi, which discloses a central computer system that allows for two-way communication between mobile device users, and similar to Paul, which discloses a proxy messaging system for use in a mobile telephone application which allows for communication between two mobile device users to be routed through a server of the proxy messaging system. (*See my discussions above for limitations [1.pre]-[1.bi] and my discussions in Sections VIII.A-B.*) A person of ordinary skill in the art would have therefore had good reason to consider the teachings of Jarvinen when implementing the Olmi-Paul system/method as I discuss above for this claim.

106. A person of ordinary skill in the art would have also recognized upon considering Jarvinen that it also discloses that the SMS server assigns a user identifier (also referred to as a CHAT2000 ID) that is used to identify the user and stores information in a database reflecting the relationship between a user’s phone number (i.e., calling-party number) and the user’s CHAT2000 ID user identifier. (EX1007, Abstract (“[A] **customer-specific user identifier**...is allocated to each customer (1, 2) of the communications service....”), 3:18-22 (“SMS server 4 issues the user with a **CHAT2000 ID, i.e. a communications service user identifier**, if

the user does not already have one. **SMS server 4 then makes an entry in database 6 consisting of the notice, the CHAT2000 ID and calling-party number of the user** posting the notice, and the identifier of the cell through which the short text message was sent.”.) Jarvinen explains that the user identifier is “intended to conceal the real identity of the customer” (*id.*, Abstract) and “permits completely anonymous communication with other systems users, with no danger in the service of the user’s own identity being revealed” (*id.*, 2:21-23; *see also id.*, 5:13-14 (“A customer who has received a message has a possibility to respond anonymously to the sender.”).)

107. Jarvinen also explains that after an original message is sent from the sender to the SMS server, the SMS server forms an outgoing message for forwarding that comprises the original message with the sender’s user identifier attached and then forwards this outgoing message to the intended customer/recipient. (*Id.*, Abstract (“[A] message addressed to at least one other customer (2) is received from a first customer (1), **the user identifier of the customer sending the message is attached to the received message, and the message and the attached user identifier are forwarded to at least one other customer** of the communications service.”), 4:28-5:7 (“Customer 1 of the communications service, who has sent the message, is identified, when: **the user code of customer 1 who has sent the received message is attached to the message**, a message-specific destination area,

comprising one or more cells of the mobile telephone network, is defined for each message to be forwarded, and **the message and the attached user identifier is forwarded to at least one second customer 2** of the communications service, who is in the destination area defined for the message being sent.”.)

108. In Jarvinen, the recipient (some customer B) may respond to the original sender (some customer A) by selecting customer A’s CHAT2000 ID user identifier as the destination and sending a message to the SMS server, which then uses the database to identify the actual phone number of customer A corresponding to customer A’s CHAT2000 ID and forwards customer B’s message to customer A by attaching customer B’s CHAT2000 ID to the message. (EX1007, 4:5-10 (“When using a short text message to respond, user 2 writes their response and sends it as a short text message to user 1, who sent the original message. In this case, **the responding user 2 selects the recipient’s CHAT2000 ID as the destination number for the message. When it receives the message, SMS centre 4 checks the database to find the actual telephone number corresponding to the recipient’s CHAT2000 ID, and routes the short text message to that number.**”), 5:13-18 (“A customer who has received a message has a possibility to respond anonymously to the sender. Response can take place, for example, by writing a short text message, when **the person receiving the short text message, i.e. the sender of the original message, receives a short text message on their terminal device,**

with the communications service user identifier of the recipient of the message displayed as the sender's number.”).)

109. Jarvinen further discloses that the above-discussed method of attaching a user identifier to messages sent back and forth between a sender and recipient not only allows for anonymous communication, but “can also be used to ensure that messages always go to the correct recipient.” (EX1007, 2:21-25.) Thus, a person of ordinary skill in the art would have recognized that Jarvinen discloses that after a first message is sent from the sender to the SMS server, the SMS server’s system (“proxy messaging system”) generates a second message (“generating, by the proxy messaging system, a second message”) comprised of the first message and a user identifier of the sender (“wherein the second message comprises contents of the first message and a first unique identifier associated with the sender”). Jarvinen explains that each user identifier uniquely identifies a specific customer (“first unique identifier associated with the sender”), describing each identifier as a “customer-specific user identifier, intended to conceal the real identity of the customer, [which] is allocated to each customer...of the communications service.” (EX1007, Abstract.) Jarvinen further describes that customer-specific CHAT2000 ID identifier as corresponding to a specific telephone number of a user, such that a CHAT2000 ID may be looked up in a database mapping identifiers to phone numbers to identify the exact user corresponding to the identifier. (*Id.*, 3:18-22

(describing “SMS server 4” as “mak[ing] an entry in database 6” mapping “the CHAT2000 ID and calling-party [phone] number” to each other), 4:8-10 (“When it receives the message, SMS centre 4 checks the database to find the actual telephone number corresponding to the recipient’s CHAT2000 ID, and routes the short text message to that number.”).) A person of ordinary skill in the art would have thus understood that each user identifier described in Jarvinen is “unique” to a given user because as I discussed above, a user is identified by their corresponding CHAT2000 ID, and the SMS server stores user phone number and CHAT2000 ID pairings in a database such that a CHAT2000 ID lookup may be used to retrieve (i.e., identify) a specific user’s phone number from the database.

110. It is my opinion that Jarvinen and Olmi (in context of Paul) each describe similar features (e.g., use of mobile devices that communicate via a central system) that are reasonably pertinent to a problem the ’071 patent alleges to address (e.g., inter-device messaging). Thus, a person of ordinary skill in the art would have had reasons to consider the teachings of Jarvinen in context of Olmi and Paul, and Jarvinen since they described features in a related technical field. (*See, e.g.*, EX1001, 1:23-3:20, 13:15-54; *see also* my discussions for limitations [1.pre]-[1.b.i] discussing the teachings of Olmi, Paul; *see also* my discussions in Sections VIII.A-C.) Thus, a person of ordinary skill in the art would have been motivated to look to Jarvinen when considering and implementing Olmi-Paul transportation

system/process to facilitate the proxy messaging functionalities discussed above for limitation [1.b.i].

111. A person of ordinary skill in the art would have been motivated to include features similar to those disclosed above by Jarvinen when implementing the Olmi-Paul system/method in order to provide an improved method of proxy messaging communication in a manner consistent with the features disclosed/suggested by Paul. As I discussed above, Paul discloses giving each driver and passenger a “unique identifier separate from their cell phone number,” but does not disclose a specific implementation for the unique identifiers. (EX1006, 9; *see* my discussions above for limitations [1.a].) A person of ordinary skill in the art would have thus had sufficient reason to consider Jarvinen’s method in context of the Olmi-Paul system/method, which provides a specific implementation for using unique identifiers in a proxy messaging system. Indeed, a person of ordinary skill in the art would have understood that Jarvinen’s unique identifier method would have advantageously provided for complete anonymity while still ensuring that messages reach the correct recipient, as I discussed above. (EX1007, 2:21-25.) Moreover, a person of ordinary skill in the art would have understood that anonymity would have been a desired goal in the Olmi-Paul rideshare communication system, since Paul explains that a passenger’s and driver’s cell phone numbers and other

confidential information may be kept only at the network/data center servers.
(EX1006, 9.)

112. In light of the teachings/guidance of Jarvinen, in context of Paul's teachings as I discussed above, a person of ordinary skill in the art would have had good reason to configure the proxy communication system of the Olmi-Paul system/method such that messages sent from sender (either a passenger or driver) to the central computer system's proxy messaging system would be forwarded to the intended recipient (the other of the driver or passenger) by creating a second message containing the contents of the first message and the unique identifier of the original sender, with similar processes enabled to allow the recipient to respond in the same manner.

113. A person of ordinary skill in the art would have appreciated and understood that Paul looks to provide inter-device messaging via a central system, and so a person of ordinary skill in the art would have looked at ways to facilitate and/or improve on the processes/techniques to facilitate such communications. (*See* my discussions above for limitation [1.b.i].) Moreover, Paul explains that the network communications can be facilitated using mobile device/cellular technologies, relevant to Jarvinen's teachings. (EX1006, 6 (passenger's cellular zone), 8 (cell phone or other wireless device), 9, 15, 17; EX1007, Abstract, 1:3-12.) Therefore, a person of ordinary skill in the art would have looked to teachings in the

art to consider ways to implement, configure, improve, and/or complement such features. A person of ordinary skill in the art would have considered the teachings in Jarvinen for application to a transportation system (like in the Olmi-Paul system/method) because a person of ordinary skill in the art would have understood that technologies/techniques to perform proxy messaging functions by adding a unique identifier to a transport request message received from a passenger and forwarded to a vehicle/driver were known in the art. (*See e.g.*, state of art teachings consistent with a person of ordinary skill in the art's knowledge at the time in EX1012, ¶[0028] (describing a “dispatch center terminal” that “assigns an identification number” to a dispatch request received from a user mobile terminal, and “transmits the dispatch request information with the assigned identification numbers to these taxi terminals” that may service the request), Abstract, ¶¶[0001]-[0006], FIG. 1.)¹⁶ Thus, based on their experience and knowledge in context of Jarvinen's teachings/suggestions and Olmi-Paul, a person of ordinary skill in the art would have been led to implement the above modification to the Olmi-Paul system/process for the reasons I discuss above.

¹⁶ I refer to EX1012 as an example of a person of ordinary skill in the art's state of the art knowledge known at the time, which is consistent with my opinions above in Section V.

114. For similar reasons, it is my opinion that a person of ordinary skill in the art would have had a reasonable expectation of success in implementing such a modification. As I discussed, Paul and Jarvinen disclose similar proxy messaging features, such as assigning unique user identifiers when implementing a proxy messaging system that stores all contact/confidential information at the network/data center servers, as in Paul. (EX1006, 8.) Thus, a person of ordinary skill in the art would have understood that implementing the Olmi-Paul-Jarvinen combined features would have involved modifying the Olmi-Paul system/method in a manner Paul suggests was feasible—implementing a fully anonymous proxy communication system by using unique identifiers to identify senders and recipients of messages, as taught by Jarvinen. Moreover, both Olmi and Paul disclose a central computer system (e.g., consisting of network/data center servers) that uses databases to store various data pertaining to users and their devices (*see* EX1005, 30, 32-35; EX1006, 10-12, 19), and thus a person of ordinary skill in the art would have understood that features similar to Jarvinen’s messaging features, which are described as being implemented using an SMS server, database, and user devices, would have been predictably implemented.

115. A person of ordinary skill in the art would have had the skills, knowledge, and motivation to implement, and reasonable expectation of success in achieving, such a modification, because it would have involved a combination of

known technologies (e.g., known shared transport systems employing two-way communication (Olmi) and known proxy communication systems (Paul and Jarvinen)) according to known techniques (e.g., known programming and component design techniques involving use of unique user identifiers to implement anonymous communication in a proxy messaging system (e.g., Jarvinen and state of the art knowledge)). Such a modification would have been foreseeable and resulted in the Olmi-Paul system/process using conventional software and component design techniques/technologies such that messages are forwarded from the Olmi-Paul central computer system's proxy messaging system to an intended recipient by generating a second message comprising the contents of the sender's first message and a unique identifier of the sender, like that claimed.

- (3) [1.b.iii] transmitting, by the proxy messaging system, the second message to a recipient device of a recipient, wherein the recipient is the other of the transport user and the transport provider.**

116. The Olmi-Paul-Jarvinen combination I discuss above discloses/suggests this limitation for the same reasons I discuss above for limitation [1.b.ii]. My analysis for limitation [1.b.ii] demonstrates how the Olmi-Paul-Jarvinen combination discloses/suggests a process/system where after a sender (either a passenger device or driver device) sends a first message to the proxy messaging system of the central computer system, that proxy messaging system then generates

a second message comprised of the original message and the sender's unique identifier, and then sends that second message to the mobile device of the intended recipient ("transmitting, by the proxy messaging system, the second message to a recipient device of a recipient"), where the intended recipient is the other of the passenger or driver ("wherein the recipient is the other of the transport user and the transport provider"), as recited in limitation [1.b.iii]. Those reasons, disclosures, and suggestions, and resulting motivations to implement features from Jarvinen with those of the Olmi-Paul system and method apply here as well for this limitation. Thus, a person of ordinary skill in the art would have had the same motivation and expectation of success in configuring the Olmi-Paul-Jarvinen system and method in such a manner that predictably led to features like that recited in this claim limitation.

2. Claim 2: The method of claim 1, wherein the second message is without private information associated with the sender, the private information being a name and/or contact information of the sender

117. In my opinion, the Olmi-Paul-Jarvinen combination discloses/suggests this limitation. As I discussed for limitation [1.b.ii], the Olmi-Paul-Jarvinen combination discloses/suggests that the second message generated by the proxy messaging system of the central computer system does not include private information, such as the actual phone number of the sender ("wherein the second message is without private information associated with the sender, the private

information being...contact information of the sender”) because the unique user identifier is used to enable anonymous communication between passengers and drivers. (See my discussions above for limitations [1.b.ii]; EX1006, 9.) Those reasons, disclosures, and suggestions, and resulting motivations to implement features from Jarvinen with those of the Olmi-Paul system and method as applicable here for this limitation. Thus, a person of ordinary skill in the art would have had the same motivation and expectation of success in configuring the Olmi-Paul-Jarvinen system and method in such a manner that predictably led to features like that recited in this claim limitation

3. Claim 10

- i) **[10.a] The method of claim 1, further comprising: receiving, by the proxy messaging system, a third message from the recipient device, the third message comprising the first unique identifier associated with the sender;**
- ii) **[10.b] identifying, by the proxy messaging system, the sender device based on the first unique identifier included in the third message;**
- iii) **[10.c] generating, by the proxy messaging system, a fourth message, wherein the fourth message comprises contents of the third message and a second unique identifier associated with the recipient.**

118. The Olmi-Paul-Jarvinen combination discloses/suggests these limitations.

119. To explain how the Olmi-Paul-Jarvinen combination discloses/suggests these limitations, I refer in the discussion below to a “Customer A,” which refers to the original sender of the first message, and to a “Customer B,” which refers to the original recipient of the second message (and thus the “recipient” who sends the “third message” as recited in claim 10).

120. With that backdrop and in that context, I reference my discussion above for limitation [1.b.ii], which explains that Jarvinen discloses that after an original sender (some customer A) sends a first message to the SMS server, which is forwarded as a second message to the recipient (some customer B), customer B may respond to customer A by selecting customer A’s CHAT2000 ID unique user identifier as the destination and sending a message to the SMS server. When it receives the response, the SMS centre checks the database to identify the actual phone number of customer A corresponding to customer A’s CHAT2000 ID and forwards customer A’s message to customer B by attaching customer B’s CHAT2000 ID to the message. (EX1007, 4:5-10 (“When using a short text message to respond, user 2 writes their response and sends it as a short text message to user 1, who sent the original message. In this case, **the responding user 2 selects the recipient’s CHAT2000 ID as the destination number for the message. When it receives the message, SMS centre 4 checks the database to find the actual telephone number corresponding to the recipient’s CHAT2000 ID, and routes**

the short text message to that number.”), 5:13-18 (“A customer who has received a message has a possibility to respond anonymously to the sender. Response can take place, for example, by writing a short text message, when **the person receiving the short text message, i.e. the sender of the original message, receives a short text message on their terminal device, with the communications service user identifier of the recipient of the message displayed as the sender’s number.”).)**

121. Thus, Jarvinen discloses that the original recipient (customer B) responds by sending a new message to the SMS server’s proxy messaging system (“receiving, by the proxy messaging system, a third message from the recipient device”), with the message addressed using customer A’s CHAT2000ID (including the unique identifier associated with the original sender) (“the third message comprising the first unique identifier associated with the sender”).

122. As I discussed above, Jarvinen also explains that when a response message (third message) is sent using the recipient’s CHAT2000 ID, the SMS center/server checks the database to find the actual telephone number corresponding to that CHAT2000 ID (customer A) and then sends the short text message to the desired recipient (“identifying, by the proxy messaging system, the sender device based on the first unique identifier included in the third message”). (EX1007, 4-5.) Jarvinen further explains that, when the recipient responds anonymously, the original sender receives a short text message with the communications-service user

identifier of the recipient displayed as the sender's number ("generating, by the proxy messaging system, a fourth message") and when a call is connected, the IVRS displays the communications-service user identifier of the original recipient (customer B) of the message on the mobile phone of the person receiving the call ("wherein the fourth message comprises contents of the third message and a second unique identifier associated with the recipient"). (EX1007, 5-7; *see also* my discussions above for limitation [1.b] in Section IX.A.4.iii.)

123. A person of ordinary skill in the art would have been motivated to implement in the Olmi-Paul-Jarvinen system/method the above-discussed proxy messaging features to allow a recipient to respond to an original sender in the same manner that the original message was sent (i.e., routing communication through the proxy messaging system and using unique identifiers to maintain anonymity in both directions). A person of ordinary skill in the art would have had the same reasons, rationale, and expectation of success as I explained for limitation [1.b.ii], to implement the features disclosed by Jarvinen and discussed above with the other proxy messaging system features disclosed/suggested by the Olmi-Paul-Jarvinen combination. (*See* my discussions above for limitation [1.b].) In addition, as I discuss above for limitations [1.pre]-[1.b], Paul discloses two-way communication between the passenger and driver, and thus a person of ordinary skill in the art would have understood that message response/return communication features for

identifying a user, similar to those disclosed by Jarvinen, would have been easily implemented in the Olmi-Paul-Jarvinen system/method. (EX1006, 8 (“[T]he **passenger’s cell phone (or other wireless device)** number may be transmitted to the driver and/ or the **driver’s cell phone** number may be transmitted to the passenger 170, so that **the two can communicate directly over the wireless network 120.**”), 9 (describing messages from driver to passenger to, e.g., “update the passenger 170 of any changes to the arrival time estimate”), 10 (describing messages from passenger to driver to, e.g., “notify...the driver that she has decided to cancel the trip, change the pickup time, pickup location, and/or any other changes to her itinerary”).)

124. A person of ordinary skill in the art would have had the skills to implement and reasonable expectation of success in achieving such a modification, because it would have involved a combination of known technologies (e.g., known two-way communication systems in a shared transport system (Olmi) and known proxy communication systems (Paul and Jarvinen)) according to known techniques (e.g., known two-way proxy communication methods (Jarvinen)). Such an implementation would have predictably yielded a system/method of the Olmi-Paul-Jarvinen combination, like that recited in claim 10, in which an original recipient (passenger/driver) may respond to the original sender (the other of the passenger/driver) by sending a **third message** (addressed using the original sender’s

unique identifier) to the proxy messaging system of the central computer system, upon which the proxy messaging system uses the unique identifier in the third message to identify the original sender's device (i.e., the actual phone number), generates a **fourth message** including the original recipient's unique identifier and the contents of the responsive third message, and transmits that fourth message to the original sender's device.

- 4. Claim 11: The method of claim 10, wherein the fourth message is without private information associated with the recipient, the private information being a name and/or contact information of the recipient.**

125. The Olmi-Paul-Jarvinen combination discloses/suggests this limitation. As I discussed for limitations [1.b.ii] and [10.a]-[10.c], the Olmi-Paul-Jarvinen combination discloses/suggests that the fourth message generated by the proxy messaging system of the central computer system does not include the actual phone number of the original recipient (i.e., the user/device that sent the third message to the proxy messaging system) ("wherein the fourth message is without private information associated with the recipient, the private information being a name and/or contact information of the recipient") because the unique user identifier is used to enable anonymous communication between passengers and drivers in both directions. (See my discussions above for limitations [1.b.ii] and [10.a].) Thus, for the same reasons, the Olmi-Paul-Jarvinen combination discloses/suggests claim 11.

5. Claim 12: The method of claim 1, wherein the sender device and the recipient device are connected to the proxy messaging system via a data communication network.

126. The Olmi-Paul-Jarvinen combination discloses/suggests this limitation. As I discussed for limitations [1.b.i]-[1.b.iii], the sender's wireless device ("sender device") and the recipient's wireless device ("recipient device") send messages through a "proxy messaging system" operated by the central computer system. (See my discussions above for limitations [1.b.i]-[1.b.iii].) As I discussed for limitation [1.pre], Paul discloses that passengers and drivers (i.e., the senders and recipients, depending on the direction of a message) communicate and transmit/receive data through a wireless communication network ("data communication network") that connects users' wireless devices to the central computer system (i.e., to the proxy messaging system that is part of the central system) ("wherein the sender device and the recipient device are connected to the proxy messaging system via a data communication network"). (See my discussions above for limitation [1.pre]; see also EX1006, 3 ("Embodiments of the invention may be implemented within a networking architecture such as that illustrated in Figure 1. The particular embodiment shown in Figure 1 includes a **wireless communication network 120** for supporting communication between two or more wireless devices (e.g., device 160). The **wireless communication network 120** may also include a **communication link to a larger network 110** such as the Internet over which a

plurality of servers 130 and clients 140 communicate.”), 3 (disclosing that the **“personal wireless device 160 operated by a user 170”** includes devices such as **“mobile telephones, two-way pagers and personal digital assistants (‘PDAs’)”** and **communicates with other devices using “existing mobile networking technologies...and existing Internet technologies”**), 4 (“In one embodiment, one or more **transportation vehicles 180** are also equipped with wireless devices (not shown) capable of **transmitting and receiving various types of data over the wireless network 120.** ”), 4-5 (“In one embodiment, one or more **data centers equipped with servers 130 and/ or 125 for providing the transportation services described herein** (hereinafter ‘transportation services’) are operated and maintained on a regional basis, based on the demands of the marketplace and/ or the geographical scope of the service.”).)

127. Accordingly, for the reasons that I discuss above and for limitations [1.pre] and [1.b.i]-[1.b.iii], the Olmi-Paul-Jarvinen combination discloses/suggests claim 12.

6. **Claim 13: The method of claim 1, wherein the second message is transmitted to the recipient device via at least one of a short messaging service, an e-mail service, a voice messaging service, and a phone call service.**

128. The Olmi-Paul-Jarvinen combination discloses/suggests this limitation. As I discussed for limitation [1.b.i], the Olmi-Paul-Jarvinen combination

discloses/suggests that the messages sent between passengers and drivers (and routed through the proxy messaging system of the central computer system), including the second message transmitted from the proxy messaging system of the central computer system to the recipient's wireless device ("wherein the second message is transmitted to the recipient device"), may be in a message format such as SMS (i.e., Short Message Service) in wireless environments ("via at least one of a short messaging service..."). (See my discussions above for limitation [1.b.i]; see also EX1006, 9 ("Alternatively, or in addition, **the updates may be comprised of a combination of both pull and push communications technology** (e.g. pull up to a fixed time before arrival then a push notification). In one particular embodiment, the pull mechanism is a periodic reference to an updated WAP page or Web page by the wireless device 160, and **the push mechanism is a Short Message Service ('SMS') message or pager notification transmitted by the server 125, 130 for wireless environments** and/ or an email or instant message for wired modes.").)

129. Accordingly, for the reasons I discuss above and for limitation [1.b.i], the Olmi-Paul-Jarvinen combination discloses/suggests claim 13.

7. Claim 14

- i) [14.pre] A system for exchanging messages between entities of a shared transport system, the system comprising:**
- ii) [14.a] a memory having processor-readable instructions stored therein; and**
- iii) [14.b] a processor configured to access the memory and execute the processor-readable instructions which, when executed by the processor, configure the processor to perform a plurality of functions comprising:**

130. I have been asked to assume that limitation [14.pre] is limiting. Under that assumption, it is my opinion that Olmi in view of Paul discloses/suggests the preamble of claim 14 ([14.pre]) and also discloses/suggests the features of limitations [14.a]-[14.b] to perform the method claimed in claim 14, as I discuss further below.

131. For example, my discussions and analysis above for limitation [1.pre] explains how the Olmi-Paul combination discloses/suggests a transportation ecosystem/rideshare communication system (“system”) that comprises a wireless network with a central computer system (“shared transport system”) through which the mobile devices of potential passengers and drivers (“entities of a shared transport system”) may communicate and send/receive messages (“[a] system for exchanging”).

messages between entities of a shared transport system").¹⁷ (See my discussions above for limitation [1.pre].)

¹⁷ For reasons explained in this Section and above for Claim 1, the Olmi-Paul combination discloses/suggests the claimed “shared transport system” under Petitioners’ proposed construction. (See my discussions in Section IX.A.1.a.) Also, for reasons similar to that explained above for Claim 1, Olmi (including as modified herein) discloses a “shared transport system” under the scenario I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss below) under the assumption that Petitioners’ proposed construction is not applied to the claim term. For reasons explained for Claim 1, under that assumption, my opinions do not change in that Olmi as modified herein still discloses a “shared transport system” under any reasonable interpretation of the term consistent with the language of the claims of the ’071 patent, its specification, and from my review of the prosecution history for the ’071 patent, for the same reasons that I explain herein and above for Claim 1. Meaning, how the Olmi system and method (including as modified in light of Paul (and later below in view of Jarvinen)) still disclose the claimed “shared transport system” in a manner consistent with and in context of the ’071 patent.

132. The Olmi-Paul combination also discloses/suggests “a memory having processor-readable instructions stored therein” and “a processor configured to access the memory and execute the processor-readable instructions which, when executed by the processor, configure the processor to perform a plurality of functions comprising” the functions recited in limitations [14.b.i]-[14.b.ii.C]. (See my discussions below for these limitations.) For example, Olmi discloses that its central controlling computer system is a “data-processing system” that may “compris[e] a set of distributed...computer processors,” and that “the term controlling computer system not only refers to the data-processing hardware, but also encompasses the data-processing instructions (computer programming code) running on this hardware.” (EX1005, 13.) Paul also discloses that the invention “include[s] various steps,” where “[t]he steps may be embodied in machine-executable instructions” and “[t]he instructions can be used to cause a general-purpose or special-purpose processor to perform certain steps.” (EX1006, 17.) A person of ordinary skill in the art would have thus understood that the Olmi-Paul system includes “a processor configured to...execute the processor-readable instructions which, when executed by the processor, configure the processor to perform a plurality of functions.”

133. A person of ordinary skill in the art would have also understood that the Olmi-Paul system includes “a memory having processor-readable instructions stored therein.” Olmi explains that the system’s “data-processing instructions” include

“computer instructions or code” that may be “encapsulated in hardware (such as firmware or purpose-designed integrated circuits).” (EX1005, 12.) Paul further explains that the invention also provides for a “machine-readable medium for storing the machine-executable instructions,” where “[t]he machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, CD-ROMs, and magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, propagation media or other type of media/machine-readable medium suitable for storing electronic instructions.” (EX1006, 20.) Thus, a person of ordinary skill in the art would have understood that the Olmi-Paul system would have had processing instructions stored in machine-readable hardware/memory (“a memory having processor-readable instructions stored therein”).

134. A person of ordinary skill in the art would have understood that the Olmi-Paul system’s processor (i.e., the processor of the central computer system) would necessarily be configured to access the memory (“a processor configured to access the memory”) in order to execute the instructions and perform the functionalities disclosed by Olmi and Paul, as I discussed above. Such an understanding of Olmi and Paul’s disclosures would have been consistent with a person of ordinary skill in the art’s understanding of computer-implemented systems/processes as described by Olmi and Paul. (*Id.*; see also, e.g., EX1010, FIG. 1, ¶¶[0006], [0022]-[0023] (describing server system (including a processor and

memory) for maintaining data, and processing information and performing processes relating to demand/capacity in a transportation system); EX1010, 3:5-4:17, 5:12-22 16:31-17:19, FIG. 5 (similarly describing server system (including a processor and memory) for processing transportation requests from passengers and matching/assigning passengers to drivers accordingly).)¹⁸ A person of ordinary skill in the art would have further understood that implementing the central computer system/server functionality described by Olmi and Paul necessarily entails at least one processor executing stored instructions and using memory to store program code and operational data (e.g., request records, identifiers, and routing/matching state). These “processor,” “memory,” and “instructions” elements are conventional for the disclosed server/network architectures and would have been known to a person of ordinary skill in the art implementing the described systems at the time of the alleged invention for the '071 patent.

¹⁸ I refer to EX1010 and EX1011 to provide examples of disclosures consistent with the state of the art knowledge of a person of ordinary skill in the art at the time consistent with my opinions above in Section V.

- (1) [14.b.i]¹⁹ identifying, by the share transport system, a transport user and a transport provider based on:**

 - a) [14.b.i.A] receiving, by the shared transport system, a transport request from a transport user device of a transport user, wherein the transport request includes a pick-up location; and**
 - b) [14.b.i.B] determining, by the shared transport system, a transport provider device of a transport provider in proximity to the pick-up location received in the transport request; and**
- (2) [14.b.ii] upon identifying, by the shared transport system, the transport user and the transport provider, and at a time before or after transport of the transport user by the transport provider:**

 - a) [14.b.ii.A] receiving, by a proxy messaging system, a first message from a sender device of a sender, wherein the sender is one of the transport user and the transport provider, and the proxy messaging system is part of the shared transport system;**
 - b) [14.b.ii.B] generating, by the proxy messaging system, a second message, wherein the second message comprises contents of the first message and a first unique identifier associated with the sender; and**
 - c) [14.b.ii.C] transmitting, by the proxy messaging system, the second message to a recipient device of a recipient, wherein the recipient is the other of the transport user and the transport provider.**

135. Limitations [14.b.i]-[14.b.ii.C] recite language similar to that of limitations [1.a]-[1.b.iii]. (See EX1001, Claims 1 and 14.) Accordingly, the Olmi-Paul combination (including as further modified above in view of Jarvinen) discloses/suggests limitations [14.b.i]-[14.b.ii.C] for the same reasons as I discussed above for limitations [14.pre]-[14.b] (addressing claimed system/processor/memory) and respectively limitations [1.a]-[1.b.iii] (addressing same “functions” recited in claim 14).²⁰ (See my discussions above for limitations

¹⁹ I was asked to assume the “share transportation system” claim language refers to the “shared transportation system” recited in the preamble of claim 14. I applied that understand in my analysis herein.

²⁰ For reasons explained in this Section and above for Claim 1, the Olmi-Paul combination discloses/suggests the claimed “transport provider” and “pick-up location” under Petitioners’ proposed constructions. (See my discussions above for claim 1). Also for similar reasons I explain above for claim 1, Olmi (including as modified herein) discloses a “transport provider” and a “pick-up location” under the scenario I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss herein) under the assumption that Petitioners’ proposed constructions for those terms are not applied to the claim

[1.a]-[1.b] and [14.pre].) Thus, the Olmi-Paul-Jarvinen combination discloses/suggests the recited method of claim 14.

8. Claim 15: The system of claim 14, wherein the second message is without private information associated with the sender, the private information being a name and/or contact information of the sender.

136. In my opinion, the Olmi-Paul-Jarvinen combination discloses/suggests claim 15 for the same reasons as I discussed for claims 2 and 14. (*See* my discussions above for claims 2 and 14.)

terms. For reasons explained for Claim 1, under that assumption, my opinions do not change in that Olmi as modified herein still discloses a “transport provider” and “pick-up location” under any reasonable interpretation of the terms consistent with the language of the claims of the ’071 patent, its specification, and from my review of the prosecution history for the ’071 patent, for the same reasons that I explain herein and above for Claim 1. Meaning, how the Olmi system and method (including as modified in light of Paul (and in view of Jarvinen)) still disclose the claimed “transport provider” and “pick-up location” in a manner consistent with and in context of the ’071 patent.

9. Claim 17

- i) [17.a] The system of claim 14, the plurality of functions further comprising: receiving, by the proxy messaging system, a third message from the recipient device, the third message comprising the first unique identifier associated with the sender;**
- ii) [17.b] identifying, by the proxy messaging system, the sender device based on the first unique identifier included in the third message;**
- iii) [17.c] generating, by the proxy messaging system, a fourth message, wherein the fourth message comprises contents of the third message and a second unique identifier associated with the recipient.**

137. In my opinion, the Olmi-Paul-Jarvinen combination discloses/suggests claim 17 for the same reasons as I discussed for claims 10 and 14. (*See my discussions above for claims 10 and 14.*)

- 10. Claim 18: The system of claim 17, wherein the fourth message is without private information associated with the recipient, the private information being a name and/or contact information of the recipient.**

138. In my opinion, the Olmi-Paul-Jarvinen combination discloses/suggests claim 18 for the same reasons as I discussed for claims 11 and 14. (*See my discussions above for claims 11 and 14.*)

- 11. Claim 19: The system of claim 14, wherein the sender is the transport provider and the recipient is the transport user.**

139. In my opinion, the Olmi-Paul-Jarvinen combination discloses/suggests claim 19 for reasons that I discuss for limitations [1.b.i]-[1.b.ii] and claim 14. As I

discussed for limitations [1.b.i]-[1.b.ii], in the Olmi-Paul-Jarvinen combination, the sender of a message may be either the driver or passenger, with the recipient being the other user, and thus the Olmi-Paul-Jarvinen combination discloses/suggests the sender may be the driver and the recipient the passenger (“wherein the sender is the transport provider and the recipient is the transport user”). (See my discussions above for limitations [1.b.i]-[1.b.ii].) For instance, as I discussed for limitation [1.b.i], Paul discloses that a driver may sent a message to a passenger to provide updates to arrival time estimates. (See my discussions above for limitations [1.b.i]; EX1006, 9 (“The driver then proceeds to the pickup point. **As the driver continues on her way, she may update the passenger 170** of any changes to the arrival time estimate including, for example, the fact that she has arrived at the pickup point.”).)

12. Claim 20

- i) **[20.pre] A non-transitory computer readable medium comprising processor-readable instructions which, when executed by a processor, configure the processor to perform a plurality of functions for exchanging messages between entities of a shared transport system, the plurality of functions comprising:**

140. I was asked to assume the preamble of claim 20 is limiting. Under that assumption, it is my opinion that Olmi in view of Paul discloses/suggests the limitations therein for reasons similar to those I discuss above for Claims 1 and 14, and below.

141. My analysis for limitations [14.pre]-[14.b] demonstrates how the Olmi-Paul combination discloses/suggests similar features. (*See* my discussions for limitations [14.pre]-[14.b] (demonstrating how the Olmi-Paul combination discloses/suggests a “processor” and “memory” with “instructions” (which is “[a] non-transitory computer readable medium comprising processor-readable instructions”) that are executed by the processor in the Olmi-Paul system’s rideshare communication system to allow for the exchange of messages between the wireless devices of passengers/drivers (“which, when executed by a processor, configure the processor to perform a plurality of functions for exchanging messages between entities of a shared transport system”))).) For those same reasons I discussed for limitations [14.pre]-[14.b], the Olmi-Paul combination discloses/suggests limitation [20.pre].²¹ Moreover, for the additional reasons below for limitation [20.b], the

²¹ For reasons explained in this Section and above for Claims 1 and 14, the Olmi-Paul combination discloses/suggests the claimed “shared transport system” under Petitioners’ proposed constructions. (*See* my discussions for claims 1 and 14.) Also, for reasons similar to that explained above for Claims 1 and 14, Olmi (including as modified herein) discloses a “shared transport system” under the scenario I was also asked to consider the Olmi-Paul combination (and further as modified in view of

Olmi-Paul-Jarvinen combination discloses/suggests the “processor” configured to perform the plurality of functions as recited in claim 20.

Jarvinen as I discuss herein) under the assumption that Petitioners’ proposed construction is not applied to the claim term. For reasons explained for Claims 1 and 14, under that assumption, my opinions do not change in that Olmi as modified herein still discloses a “shared transport system” under any reasonable interpretation of the term consistent with the language of the claims of the ’071 patent, its specification, and from my review of the prosecution history for the ’071 patent, for the same reasons that I explain herein and above for Claims 1 and 14. Meaning, how the Olmi system and method (including as modified in light of Paul (and in view of Jarvinen)) still disclose the claimed “shared transport system” in a manner consistent with and in context of the ’071 patent.

- ii) **[20.a]²² identifying, by the share transport system, a transport user and a transport provider based on:**
 - (1) **[20.a.i] receiving, by the shared transport system, a transport request from a transport user device of a transport user, wherein the transport request includes a pick-up location; and**
 - (2) **[20.a.ii] determining, by the shared transport system, a transport provider device of a transport provider in proximity to the pick-up location received in the transport request; and**
- iii) **[20.b] upon identifying, by the shared transport system, the transport user and the transport provider, and at a time before or after transport of the transport user by the transport provider:**
 - (1) **[20.b.i] receiving, by a proxy messaging system, a first message from a sender device of a sender, wherein the sender is one of the transport user and the transport provider, and the proxy messaging system is part of the shared transport system;**
 - (2) **[20.b.ii] generating, by the proxy messaging system, a second message, wherein the second message comprises contents of the first message and a first unique identifier associated with the sender; and**
 - (3) **[20.b.iii] transmitting, by the proxy messaging system, the second message to a recipient device of a recipient, wherein the recipient is the other of the transport user and the transport provider.**

142. Limitations [20.a]-[20.b.iii] recite language similar to that of limitations [1.a]-[1.b.iii]. (See EX1001, Claims 1 and 20.) Accordingly, the Olmi-

Paul combination (including as further modified above by Jarvinen) discloses/suggests limitations [20.a]-[20.b.iii] for the same reasons as I discussed above for limitation [20.pre] (addressing claimed system/processor/memory) and respectively limitations [1.a]-[1.b.iii] (addressing same “functions” recited in claim 20).²³ (*See* my discussions above for limitation [20.pre].) Thus, for those reasons,

²² I was asked to assume the “share transport system” recited in the claim language refers to the “shared transport system” recited in the preamble of claim 20. I applied that understanding in my analysis herein.

²³ For reasons explained in this Section and above for Claims 1 and 14, the Olmi-Paul combination discloses/suggests the claimed “transport provider” and “pick-up location” under Petitioners’ proposed constructions. (*See* my discussions above for claims 1 and 14). Also for similar reasons I explain above for claims 1 and 14, Olmi (including as modified herein) discloses a “transport provider” and a “pick-up location” under the scenario I was also asked to consider the Olmi-Paul combination (and further as modified in view of Jarvinen as I discuss herein) under the assumption that Petitioners’ proposed constructions for those terms are not applied to the claim terms. For reasons explained for Claims 1 and 14, under that assumption, my opinions do not change in that Olmi as modified herein still

the Olmi-Paul-Jarvinen combination discloses/suggests the limitations recited in claim 20.

discloses a “transport provider” and “pick-up location” under any reasonable interpretation of the terms consistent with the language of the claims of the '071 patent, its specification, and from my review of the prosecution history for the '071 patent, for the same reasons that I explain herein and above for Claim 1. Meaning, how the Olmi system and method (including as modified considering Paul (and in view of Jarvinen)) still disclose the claimed “transport provider” and “pick-up location” in a manner consistent with and in context of the '071 patent.

X. CONCLUSION

143. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: March 11, 2026

By: 

Petros Ioannou, Ph.D.