

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS AMERICA, INC.
SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

KONINKLIJKE KPN N.V.,
Patent Owner

IPR2025-00503
Patent No. 8,660,560

EXPERT DECLARATION OF JACOB SHARONY, PH.D.

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I. INTRODUCTION

1. I have been retained as a technical expert by Koninklijke KPN N.V., (“Patent Owner”) and asked to provide my objective and unbiased opinions concerning U.S. Patent No. 8,660,560 (“the ’560 Patent”). Specifically, I have been asked to provide my opinions on the patentability of the ’560 Patent in view of certain prior art references, the state of the art at the time of the claimed invention, and the knowledge of a person of ordinary skill in the art at the time of the claimed inventions. I have also been asked to provide my opinions on the arguments set forth in a Petition for *Inter Partes* Review of the ’560 Patent in IPR2024-00503 (“Petition”), which was filed by Samsung Electronics America, Inc. (“Petitioner”).

II. BACKGROUND AND QUALIFICATIONS

2. In forming the opinions expressed in this Declaration, I have considered and relied upon my education, background, and experience. In addition, I have reviewed and relied upon additional materials in preparation of this Declaration, as described below.

3. My experience, qualifications and education are detailed in my curriculum vitae (“CV”), a copy of which is submitted as Exhibit 2002. Some of my background and experience that qualifies me to offer the opinions in this Declaration are discussed further below.

4. I have over 35 years of experience working in the fields of information communication technologies (ICT), wireless networks, mobile devices and applications, and data capture and sensing, which has resulted in over 50 issued patents and numerous publications in scientific journals and conferences. I am a Life Senior Member of the Institute of Electrical and Electronic Engineers (IEEE). I have also served on various government expert panels, including for the National Science Foundation (NSF) and National Institutes of Health (NIH).

5. Since 2010, I have been an Adjunct Professor of Electrical Engineering at Columbia University, teaching graduate level courses on advanced wireless technologies including in the areas of wireless sensing and Auto ID technologies, mmWave communications, and applications for 5G wireless networks and systems.

6. I received a B.Sc. degree (1979) and M.Sc. degree (1984) in Electrical Engineering from Tel Aviv University, as well as M.Phil. (1991) and Ph.D. (1993) degrees in Electrical Engineering from Columbia University. I also have an M.B.A. degree (1989) from Tel Aviv University.

7. I have been involved with mobile and wireless networking technologies since the mid-1990s, and during my career have witnessed the change from voice-centric to data-centric networks. For nearly three decades, I have worked as a researcher, developer, and educator on wireless wide, local, and personal area

networks (WWAN, WLAN, and WPAN) infrastructure and mobile devices. I have also worked on enterprise mobility products and solutions since the late 1990s.

8. After obtaining my Ph.D., I led the advanced mobile networking group at BAE Systems, developing tactical mesh-based wireless network systems for the U.S. Department of Defense. I also conducted research and development in advanced mobile and wireless networks. My work resulted in several issued patents including U.S. Patent No. 5,652,751, titled “Architecture For Mobile Radio Networks With Dynamically Changing Topology Using Virtual Subnets,” and U.S. Patent No. 5,742,593, titled “On-line Distributed TDMA/FDMA/CDMA Link Assignment in Mobile Radio Networks With Flexible Directivity.”

9. From 1997 to 2005, I held various positions at Symbol Technologies (acquired by Motorola Solutions). While working at Symbol/Motorola, I gained substantial experience in application-specific mobile devices and wireless networking and architecture solutions in several vertical applications, *e.g.*, transportation and logistics, healthcare, warehousing, retail, and education. As Senior Director, Research and Development, I initiated and led several research and development programs in wireless LAN (local area network) technologies, including mobile device management and security. As Senior Director, Technology Strategy and Development, I was responsible for the research and development of new mobile applications for delivering multimedia-rich content to mobile devices connected

over heterogeneous networks. That work resulted in several U.S. patents, including U.S. Patent No. 7,778,649, titled “System and Method for Asset Location in Wireless Networks,” U.S. Patent No. 6,853,293, titled “Wearable Communication System,” U.S. Patent No. 7,039,358 titled “Coexistence Techniques in Wireless Networks,” U.S. Patent No. 6,925,094, titled “System and Method for Wireless Network Channel Management,” U.S. Patent No. 7,668,201 “Bandwidth management in wireless networks,” and U.S. Patent No. 7,426,383 “Wireless LAN intrusion detection based on location.”

10. In 2004, I founded Mobius Consulting, a consulting firm providing professional services in mobile wireless strategy, technologies, systems, and applications, including enterprise mobility, wireless communication networks, mobile embedded devices, device management, and mobile applications and services. In this capacity, I have worked with many companies in the mobile and wireless ecosystem including service providers and operators, equipment vendors, and semiconductor companies. Since founding Mobius Consulting, I have worked with many enterprises interested in deploying mobile and wireless solutions in order to become more productive, efficient, and cost effective. These solutions spanned numerous industry sectors and involved various mobile and wireless technologies including 3G/4G/5G Cellular, Wi-Fi, Bluetooth, ZigBee, and RFID. That work resulted in several U.S. patents, including U.S. Patent No. 9,014,702, titled

“Location Processing in Small Cells Implementing Multiple Air Interfaces,” U.S. Patent No. 9,088,923, titled “Small Cells Implementing Multiple Air Interfaces,” and U.S. Patent No. 10,080,177, titled “Unlicensed Spectrum Offload Architecture for Small-Cell Base Stations.”

III. Understanding of Legal Standards

11. I am not an attorney. For purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my opinions, as set forth below.

A. Patentability

12. I understand that for an invention claimed in a patent to be valid and patentable, it must be, among other things, new and not obvious in light of what was known and came before it. That which was known or came before the invention claimed is generally referred to as “prior art.”

13. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can be shown to “anticipate” the claim. Second, the prior art can show that the claim was obvious to a person of ordinary skill in the field of the invention at the time the invention was made.

14. I understand that, for a patent claim to be “anticipated” by the prior art, each and every element or requirement of the claim must be found, expressly or inherently, in a single prior art reference. Further, I understand that anticipation

requires that the single prior art reference must disclose the elements of the claim arranged or combined in the same way as in the claim.

15. It is my understanding that whether a claimed invention is obvious is a question of law, with underlying factual inquiries that are determined from the perspective of a person of ordinary skill in the art at the time of the claimed invention.

16. It is my understanding that a claimed invention is obvious if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art (a “POSITA”).

17. It is my understanding that obviousness requires consideration of the following underlying factual inquiries:

- determining the scope and content of the prior art
- ascertaining the differences between the claimed invention and the prior art;
- resolving the level of ordinary skill in the art; and
- evaluating objective evidence or “secondary considerations” of non-obviousness, such as commercial success, long-felt but unresolved needs, failure of others, industry praise, and unexpected results.

18. It is my understanding that a reference must be analogous art to the claimed invention in order to be properly considered for use in an obviousness

inquiry. It is my understanding that a reference is analogous art to the claimed invention if:

- the reference is from the same field of endeavor as the claimed invention (even if it addresses a different problem); or
- the reference is reasonably pertinent to the problem faced by the inventor (even if it is not in the same field of endeavor as the claimed invention).

19. It is my understanding that whether a reference is reasonably pertinent turns on how the problem faced by the inventor is reflected, either explicitly or implicitly, in the specification.

20. It is my understanding that the following are exemplary rationales that may support a conclusion of obviousness:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known techniques to improve a similar method or product in the same way;
- Applying a known technique to a known method or product ready for improvement to yield predictable results;
- Obvious to try – choosing from a finite number of identified,

predictable solutions, with a reasonable expectation of success;

- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

21. In addition to the above, I understand that a person of ordinary skill in the art may resort to logic, judgment and common sense available to him or her at the time of the invention to find a claim feature obvious, even if the prior art relied on does not explicitly state or teach that feature. I understand that when common sense is relied on to find a feature obvious, the reasoning for that conclusion must be articulated with sufficient clarity.

22. I also understand that a patent claim is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. An obviousness determination requires finding both that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so. I understand that it is important to be careful not to allow hindsight reconstruction of references to produce the claimed invention,

without any explanation as to how or why the references would be combined to produce the claimed invention.

23. Regarding “objective evidence” or “secondary considerations,” I understand that for such evidence to be relevant to the obviousness of a claim, there must be a causal relationship (called a “nexus”) between the claim and the evidence. I also understand that such objective evidence may include: commercial success of products covered by the patent claims; long-felt need for the invention; failed attempts by others to solve the problem addressed by the invention; copying of the invention by others in the field; unexpected results achieved by the invention; praise of the invention; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making or use of the invention; and that the patentee proceeded contrary to the accepted wisdom of the prior art.

24. I understand that a person of ordinary skill is also a person of ordinary creativity. I further understand that the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, but instead can take into account “ordinary innovation” that does no more than yield predictable results, which are inferences and creative steps that a person of ordinary skill in the art would be understood to employ.

25. I understand that sometimes it will be necessary to look to interrelated teachings of multiple patents and publications; the effects of demands known to the

relevant field or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art. I understand that all these issues may be considered to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

B. Prior Art

26. I understand that for purposes of this proceeding, prior art includes patents and printed publications in or outside the United States before the effective filing date of the claimed invention. I also understand that prior art includes U.S. patents, published U.S. patent applications, and published international applications (pursuant to the Patent Cooperation Treaty) that themselves have an effective filing date before the effective filing date of the claimed invention, as long as they name another inventor.

27. I also understand that prior art may include any public disclosure, including any products in public use, on sale, or otherwise available to the public, before the effective filing date of the claimed invention. I understand that information that constitutes prior art generally must be information that was publicly disclosed before the effective filing date of the claimed invention. I understand that there may be exceptions to what is prior art but have been instructed that they are not relevant for purposes of my opinions here.

C. Inherency

28. I understand that if a prior art reference does not expressly set forth a particular claim element, the prior art may still disclose that element if it is “inherent” in its disclosure. To establish inherency, it is my understanding that evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference. It is my understanding that inherency may not be established by probabilities or possibilities. In other words, it is my understanding that the mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.

29. I understand that under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform a claimed method, then the method will be considered to be anticipated by the prior art device. I also understand that when the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process.

D. Person of Ordinary Skill In The Art

30. I understand that “a person of ordinary skill in the art” or POSITA is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I understand that the term “person having ordinary skill in the art” or POSITA is sometimes used synonymously. Such a person would necessarily have

the capability of understanding any scientific and engineering principles applicable to the pertinent art.

31. I understand that factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the following:

- a. the educational level of the inventor;
- b. the type of problems encountered in the art;
- c. prior art solutions to those problems;
- d. the rapidity with which innovations are made;
- e. the sophistication of the technology; and
- f. the educational level of active workers in the field.

32. I understand that a person of ordinary skill in the art is not a real person, but rather is a hypothetical individual having the qualities reflected by the factors above. This hypothetical person has knowledge of all prior art in the relevant field as if it were arranged on a workshop wall and takes from each reference what it would teach to a person of ordinary skill in the art.

33. I understand that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton. In many cases a person of ordinary skill will be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

34. I understand that a person of ordinary skill in the art can collaborate with one or more other persons of ordinary skill in the art for one or more aspects with which the other person may have superior expertise, experience, and/or knowledge.

E. Claim Construction

35. It is my understanding that claim construction, or the interpretation of the claims of a patent, is ultimately a question of law. I have been informed that claim terms are generally presumed to carry their ordinary and customary meaning. However, I understand that a patent applicant is his own lexicographer and is entitled to provide alternate definitions of words in common usage, but if the patent applicant uses a term that is in common usage without providing an alternate definition, then that term should generally be understood as having its common meaning.

36. I understand that a person of ordinary skill in the art is deemed to read a claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent specification and the “file history” of the patent developed during examination by the Patent Office.

37. I understand that the claims, the specification, and the file history are referred to as “intrinsic evidence,” and are to be read as a person of ordinary skill in the art at the time of the invention would have done at the time of the alleged invention.

38. In addition to the intrinsic evidence, I understand that the court or tribunal may also consider other relevant evidence, which is called “extrinsic evidence,” concerning relevant scientific principles, the meaning of technical terms, and the state of the art. Such evidence includes the testimony of expert witnesses. Although extrinsic evidence may be used to resolve ambiguities that may exist after reviewing the intrinsic evidence, I understand that extrinsic evidence cannot be used to contradict a claim construction that is clear from the intrinsic evidence.

39. I understand that some claims are independent, and that those independent claims are complete by themselves. Other claims refer to these independent claims, or other dependent claims, and are “dependent” on those claims. The dependent claims include all of the limitations of the claims on which they depend.

IV. EXHIBITS

40. Exhibit 2003 referenced in my declaration is a copy of 3GPP TS 36.305 V9.0.0 (2009-09), Release 9, September 28, 2009. This exhibit is a true and correct copy of that document as published at

https://www.3gpp.org/ftp/Specs/archive/36_series/36.305 and more specifically at the link for 36305-900.zip present on that page:

https://www.3gpp.org/ftp/Specs/archive/36_series/36.305/36305-900.zip

41. Further, an expert in my field would reasonably rely on the facts or data set forth in this document in forming the opinions provided here. I am not aware of any information or reason to doubt the accuracy or truth of the contents of this document.

V. BASES FOR OPINIONS

42. The opinions set forth in this Declaration are my own. In forming the opinions herein, I have considered the exhibits to the Petition for *Inter Partes Review* filed against the '560 Patent, as well as the additional materials cited in this Declaration (including exhibits to the Patent Owner's Preliminary Response cited herein), and my education, training, and experience.

43. My analysis of the materials relating to this matter is ongoing and I will continue to review any new material that is provided to me. This Declaration represents certain opinions that I have formed to date and the bases for those opinions. I reserve the right to revise, supplement, and/or amend my opinions based on new information presented to me and on my continuing analysis of the materials cited herein or later provided to me.

VI. TECHNOLOGY BACKGROUND OF THE '560 PATENT AND THE ASSERTED GROUNDS

A. The '560 Patent

44. The '560 Patent explains that the base station within each cell of a wireless access network stores a neighbor cell list (NCL), which it broadcasts within the cell. The NCL, as its name suggests, generally contains a listing of the first cell's neighboring cells for which a user terminal connected to the first cell should send measurement reports. In some cases, a cell may maintain separate lists for neighbors within the same network (an intra-network NCL), and those in cooperating networks (an inter-network NCL). Exhibit 1001, 1:32-48.

45. Mobile user terminals (e.g., cellular telephones) can receive and store the NCL. The terminals are always scanning the frequency spectrum for certain signals, to determine which cell they should use for transmission (i.e., they “camp on” that cell). *Id.*, 1:32-48. The measurements on cells from the NCL reported by user terminals can be used by the network to make a decision whether or not a mobile terminal should be handed over to another cell so that acceptable service may be maintained. This process is referred to as “handover” (in active mode). *Id.*, 1:32-48, 6:63-7:3. Cell “reselection” is similar, but done when the terminal is in idle mode. *Id.*, 1:32-48.

46. Traditionally, populating and optimizing NCLs was done manually (off-line) using various tools, such as predictive optimization algorithms, when a

new base station is installed. *Id.*, 1:49-51. However, these tools were not perfect, and thus required network operators to perform subsequent testing to determine appropriate handover areas and to update the NCL with the correct list of neighboring cells. Exhibit 1005 ¶ 24. However, this solution was flawed given that networks and conditions affecting signal quality would gradually change, rendering the once-optimized NCL out-of-date. *Id.*

47. Thus, at the time of the invention, automated NCL optimization was being investigated. Exhibit 1001, 1:49-55. Automated processes were described in technical specifications of the 3rd Generation Partnership Project (3GPP), a consortium of telecommunications standards organizations and other organizations. *Id.*, 1:51-58. Those specifications disclosed an automatic neighbor relation (ANR) function which finds new neighbors and removes outdated neighbors from a neighbor relations table (NRT). *Id.* Under the ANR function, the base station instructs a user terminal to look for neighboring cells, and the terminal then provides a physical cell identifier of detected cells to the base station. The base station then instructs the terminal to read and report back the cell global identifier and further cell information from the detected cells. The base station then updates the NRT using the reported information. Exhibit 1001, 1:56-2:7.

48. The claimed invention improved the state of the art by limiting, in a novel way, the group of user terminals which are requested to search for neighboring

cell information. More specifically, the invention allows requests for neighboring cell information to be directed to user terminals in the regions where cell reselection and handover are about to occur. *Id.*, 3:37-47. In one embodiment, location information from the user terminals is used as a criterion for selecting the terminals requested to search for neighboring cell information. *Id.*, 5:25-27.

49. This feature is an improvement over the prior art because it tunes the amount of cell information reporting. *Id.*, 5:11-24. This relates to a trade-off between the measurement overhead (signaling load) and the potential for neighbor cell list optimization. *Id.* For example, if an operator wants to increase NCL optimization, the invention allows for selection of more terminals to report the required information, which increases the signaling those terminals must undertake (which has additional effects such as shortened battery life, etc.). Conversely, an operator may forego increased optimization to reduce unnecessary signaling over the network(s). *Id.*, 7:44-48.

B. Summary of the Asserted Grounds

50. I understand that Patent Owner has disclaimed all claims of the '560 Patent other than Claim 7. I understand that Petitioner asserts the following grounds of invalidity directed to Claim 7:

Ground	Basis	Reference(s)
2	§103	Amirijoo, TR-32.816, Kazmi
4	§103	Amirijoo, TR-32.816, Kazmi, Mach

**1. US Patent Application Publication No. 2009/0191862A1
 (“Amirijoo”)**

51. Amirijoo (Exhibit 1005) relates to a somewhat similar issue as the ’560 Patent. Both Amirijoo and the ’560 Patent relate to automatic (versus manual) updating of the neighbor relations list (NRL) or neighbor cell list. Exhibit 1005 ¶¶ 24-26. Amirijoo’s disclosure applies to handovers not only between different radio access technologies (RATs), but also to handovers in radio access networks using different radio frequencies. For that reason, it refers to “inter-RAT/frequency” to inclusively refer to either. *Id.* ¶¶ 73-74.

52. Unlike the ’560 Patent, which is focused on ways to lower the measurement and signaling load and radio resource usage imposed on user devices required for automatic list updating as previously discussed, Amirijoo is focused on when and how the terminal and base station communicate to enable updating the list. Amirijoo explains that a mobile station (user terminal) meeting appropriate triggering conditions performs the required measurements of signal quality during “reading gaps.” Exhibit 1005, Abstract, ¶ 80. The reading gap is a time period in which the mobile station does not receive information from the serving base station. *Id.*, Abstract, ¶¶ 21, 32. In order to perform the required measurements, the mobile station must tune into the frequency it is measuring, and stop listening to the serving base station, for the time needed to measure the desired information. *Id.* ¶ 90. Amirijoo details various ways in which the network and mobile terminal may

coordinate (or not) the reading gap with transmission gaps (when the serving base station is not transmitting to the mobile terminal). *Id.* ¶¶ 21, 90-98.

53. A POSITA would therefore have understood Amirijoo as focusing on enabling user terminals to measure inter-frequency and inter-RAT neighbors using transmission gaps and a two-stage CGI acquisition procedure. While it refines when measurements are made, a POSITA would not have understood Amirijoo to disclose how user terminals are selected among multiple user terminals, including based on a user terminal's physical location.

2. 3GPP Technical Report 32.816 v1.0.0 (“TR-32.816”)

54. 3GPP Technical Report 32.816 v1.0.0 (Exhibit 1006) is a 3GPP technical report pertinent to Operations and Maintenance and Network Management in Long Term Evolution (LTE) / System Architecture Evolution (SAE) networks. The report is intended to provide a study on the existing UMTS (Universal Mobile Telecommunications System) management standards and practices for the purposes of deciding on which of those shall be reused, changed, or abandoned in LTE/SAE and make recommendations about that. The asserted version of TR-32.816 is v1.0.0. The high-level topics listed in the report relate to, e.g., automatic installation of network elements, self-organizing networks, site management, configuration management, fault management, performance management.

55. As part of the “Self organising [sic] network” topic the authors list a number of use cases, one of them called “Optimisation [sic] of the neighbourhood list” which provides recommendations on input information that should be considered when optimizing the NCL in self-organizing networks. Exhibit 1006 at 11. Another use case is “Handover Optimisation [sic]” which is intended to recommend input sources, algorithms and actions to be performed in a self-organizing network for improving the handover process. Exhibit 1006 at 13.

3. U.S. Patent Application Publication No. 2009/0176490 (“Kazmi”)

56. Kazmi is directed to automating NCL updates from mobile terminals (user equipment or UE) selected based on determining which mobile terminals have a high probability of quickly obtaining a global cell identifier (GCI) of an unknown base station using signal-based metrics. Ex. 1006, Abstract, ¶¶ 3-5. Kazmi noted that a problem with merely requesting mobile terminals to obtain and report the unknown GCI was that “it may take a relatively long period of time for the UE to obtain the GCI and while the UE is attempting to obtain the GCI the UE may not be able to receive data from the base station.” *Id.* ¶ 5. To address this, Kazmi disclosed selecting mobile terminals to obtain and report the GCI based on certain parameters indicating that the mobile terminals had a strong signal from the unknown base station, so that the GCI could be obtained and reported more quickly. Kazmi taught, among other criteria, selecting mobile terminals by determining: (1) whether a

mobile terminal sent a message containing a non-unique physical layer cell identifier associated with the unknown base station more than a specified threshold within a particular time window; (2) determining which mobile terminals had reported the best cell quality information with respect to the unknown base station; (3) determining a speed value (indicating the speed at which a mobile terminal is moving); (4) determining the propagation delay between a mobile terminal and the unknown cell. *Id.* ¶¶ 9-12. Relevant portions of Kazmi’s disclosure are discussed in detail below.

57. Kazmi explains that in a mobile network, each base station may serve one or more cells, and each cell may be associated with a physical layer cell identifier (PCI) and a global cell identifier (GCI). Ex. 1007 ¶ 3. PCIs are not unique and multiple cells in a network may have the same PCI, while GCIs are globally unique. *Id.* ¶ 3. With respect to neighbor cell lists that provide, for a given cell, the PCI and GCI of each cell that neighbors the cell, Kazmi explains that they may be automatically updated by requesting a mobile terminal using the cell to obtain the GCI of a neighboring cell and report the GCI to the base station serving the cell. *Id.* ¶¶ 4-5. Kazmi’s discussion of its embodiments generally refers to cell 103a as the serving cell and cell 103b as a neighboring cell, the GCI of which is not included in the neighbor cell list of cell 103a. *Id.* ¶ 28.

58. Kazmi details a first process 200 where a base station receives a message (or alternatively cell quality information) from a mobile terminal containing the PCI of an unknown cell 103b. Ex. 1007 ¶ 29. This message is typically sent in response to an event or periodically, and may be sent for handover purposes. *Id.* ¶ 29. After receiving the message from the mobile terminal, the base station determines whether it should instruct the mobile terminal to obtain the GCI for unknown cell 103b, based on various factors including whether the PCI was already present in the neighbor cell list. *Id.* ¶ 30, 33. If needed, the base station selects a mobile terminal that has a “relatively high probability of being able to obtain the GCI within a given period of time” based on various statistical factors. *Id.* ¶ 31. The base station then instructs the selected mobile terminal to obtain the GCI for cell 103b and then receives a message containing the GCI, which it then adds to the neighbor cell list for cell 103a. *Id.* ¶ 32.

59. Kazmi details process 500 for automatically adding the GCI of cell 103b to the neighbor cell list. Ex. 1007 ¶ 34. Here, the base station sets a start time and counter for each mobile terminal. *Id.* ¶ 34. When the base station receives a message from a mobile terminal containing an identifier (PCI) associated with unknown cell 103b, it increments the counter associated with the mobile terminal. *Id.* ¶ 34. If the counter increment is less than threshold T1, the base station determines whether the amount of time that has elapsed since the start time is greater

than or equal to a second threshold T2. If so, then the process restarts and the start time and counter are reset; if not, then the base station waits for receipt of another message. *Id.* ¶ 34. If the counter increment was greater than or equal to threshold T1, the base station determines the speed of the mobile terminal that sent the message. If the base station determines that the speed is less than a speed threshold S, it instructs the mobile terminal to obtain the GCI of unknown cell 103b, which is added to the neighbor cell list when received. *Id.* ¶ 34.

60. Kazmi also details a second process 600 for automatically adding the GCI of cell 103b to the neighbor cell list. Ex. 1007 ¶ 35. Here, the base station sets a start time and initializes a counter for each mobile terminal, and also initializes a global counter (gc). When the base station receives from a mobile terminal a message containing an identifier (e.g., PCI) associated with unknown cell 103b, it increments the global counter and the counter associated with the mobile terminal that sent the message. If the global counter increment is less than a threshold T3, the base station determines whether the amount of time that has elapsed since the set start time is greater than or equal to a threshold T4; if so, the process restarts and the start time is set to the current time, and the global counter (gc) and mobile terminal counters are initialized. If not the base station waits for another message from the mobile terminal. *Id.* ¶ 35. If the global counter increment was greater than or equal to threshold T3, the base station determines which mobile terminal has the highest

counter value and instructs that mobile terminal to obtain the GCI of cell 103b, which the base station adds to the neighbor cell list upon receipt. *Id.* ¶ 35.

61. Kazmi explains that the thresholds used in process 500 and 600 are chosen “so as to provide sufficient assurance that cell 103b is indeed a neighbor cell that should be added to the neighbor cell list belonging to cell 103a.” Ex. 1007 ¶ 37. Here, Kazmi explains that these processes are expected to select a mobile terminal “close to” the unknown cell 103b for reporting of the GCI. *Id.* ¶ 37. Kazmi specifically explains that “close to” “means radio conditions experienced by the selected UE [mobile terminal] with respect to cell 103b are expected to be good,” which ensures that the mobile terminal can obtain the GCI “relatively quickly” to enable the base station “to schedule a small gap for GCI decoding so as to minimize data interruption.” *Id.* ¶ 37.

62. A similar but not identical process is described with respect to reports of cell quality information such as reference signal received power values or other cell quality metrics rather than messages. Ex. 1007 ¶ 29, 38.

63. Kazmi also describes process 1000 for use by a base station to select a particular mobile terminal, from a set of mobile terminals, to instruct to obtain the GCI of a neighbor cell. Ex. 1007 ¶ 41. Here, the base station initializes a priority point variable P for each mobile terminal in the set and selects a particular mobile terminal which is then removed from the set by setting a flag. *Id.* ¶ 41. Generally,

the process describes the base station performing various checks to determine whether and to what extent the mobile terminal's P value should be increased or decreased, performing those checks for all mobile terminals in the set, and ultimately selecting the mobile terminal with the highest P value to instruct to obtain the GCI of the unknown neighboring cell. *Id.* ¶¶ 42-46. The process increases or decreases the P value based on determinations of (a) whether the mobile terminal is in a discontinuous transmission mode; (b) the downlink data rate; (c) the speed at which the selected mobile terminal is moving; (d) a cell quality value pertaining to the unknown cell; and (e) the propagation delay between the mobile terminal and the unknown cell. *Id.*

64. A POSITA would have understood Kazmi as directed to automating NCL updates using signal-based metrics such as PCI report frequency, signal quality, and UE speed. A POSITA would not have understood Kazmi as using actual location data for UE selection, because there is no disclosure within Kazmi detailing any such usage.

4. U.S. Patent Application Publication No. 2010/0124934 (“Mach”)

65. Mach is directed to using a first wireless network to determine a mobile terminal's location, and the mobile terminal then setting operational conditions of the mobile terminal for operating in or accessing a second wireless network using that location. Ex. 1008, Abstract. Specifically, Mach teaches using GPS information

from a user terminal to replace the use of estimated position and speed derived from signal strength in various algorithms used in cellular networks. *Id.* ¶¶ 2, 23-26, 28, 38-40. These algorithms include the taking of measurements and the sending of measurement reports concerning neighboring cells. *Id.* ¶¶ 42-43. Relevant portions of Mach’s disclosure are discussed in detail below.

66. Mach generally relates to using position information (e.g., GPS) for improving performance in or of cellular network. Ex. 1008 ¶ 2. Mach explains that various cellular networks use signal strength to estimate a mobile terminal’s position or speed. *Id.* ¶ 23. Various algorithms deployed in cellular networks take into account only criteria based on measured radio signal quality, and not data that is specific to the exact or actual location of the mobile terminal. *Id.* ¶¶ 23-26. Mach proposes improving these algorithms with its invention. *Id.* ¶ 28.

67. Mach discloses employing location information, and specifically GPS information, as “more precise data as an input to algorithms deployed in cellular networks.” Ex. 1008 ¶ 38. Mach explains that a mobile terminal’s positioning system (i.e., “GPS receiver”) may include the current geographical location and current speed of the terminal. *Id.* ¶ 39. These can be used as an input to the estimated position/speed in existing radio protocols and algorithms used in mobile phones to improve their performance. ¶ 40. Mach suggests using this GPS information in a cellular network in algorithms relating to the taking of measurements and the

sending of measurement reports concerning neighbor cells. *Id.* ¶ 42. Mach teaches that a mobile terminal may activate its GPS system to provide current position information and to calculate speed. *Id.* ¶ 44. When the user terminal receives from the network certain mobility state detection thresholds defining different velocity states (low, medium, and high) and determines what state it is in based on the terminal's speed calculations, and may apply that information by setting an internal timer to indicate how frequently the mobile terminal is to measure and report neighbor cells to the base station or node which is serving the terminal at the time. *Id.* ¶ 44, 45.

68. Mach also explains that the network might use the mobile terminal's position data in its operations and maintenance functions, including RSSI (received signal strength indication) and E_c/I_o (the ratio of received signal energy per chip to power density in the band) information reported by mobile terminals. Ex. 1008 ¶¶ 4, 23, 46. At the time, cellular networks used physical vehicles to verify positions at which certain values of those indications or information were experienced. *Id.* ¶ 46. This physical position data was then used to correlate information reported by mobile terminals with the physical layout of the network. *Id.* However, this could cause variations based on factors other than "simple distance from the cell" such as attenuation from buildings or topology and interference. *Id.*

69. In Mach, existing radio protocol algorithms in the mobile terminal which previously reported signal strength using E_c/I_o and RSSI are expanded to report the GPS position as well (with the three reports referred to by Mach as a “information triplet”). Ex. 1008 ¶ 47. The serving cell then stores this information which can be used to provide more accurate network coverage. *Id.* ¶¶ 47-48.

70. Mach is specific in its disclosure that the location and velocity information from GPS (or some other positioning system) is used by the mobile terminal to determine its mobility state and apply that information to radio algorithms internal to the mobile terminal. Ex. 1008 ¶ 51. Mach also teaches that the position and speed information may be used by the network and then signaled to the mobile terminal to modify its internal algorithm. *Id.* ¶ 52.

71. A POSITA would have understood Mach as addressing how a mobile terminal itself may internally adapt measurement behavior (e.g., reporting frequency, scan ranges) based on location or mobility state derived from GPS data. A POSITA would not have understood Mach to disclose how the network selects mobile terminals for CGI reporting using location, as Mach contains no disclosure detailing any such teaching or suggestion.

VII. LEVEL OF ORDINARY SKILL IN THE ART

72. I have not been asked to provide an opinion on the level of ordinary skill in the art at the time of the invention. For purposes of this Declaration only, I

have instead been asked by Patent Owner to apply the definition of a person having ordinary skill in the art (“POSITA”) proposed by Petitioner:

A POSITA at the time of the ’560 patent had at least a bachelor’s in EE/CE/CS, physics, or equivalent, and two years of experience with computer networking technology. More education can supplement practical experience and vice versa.

Petition, 4.

73. My experience and qualifications meet and/or exceed that of a POSITA as described in Section II above. My education combined with my substantial experience designing, developing, and/or testing telecommunication systems, and my familiarity with wireless standards and protocols related to data transmission and network management, qualifies me to provide an expert opinion as to the understanding of a POSITA.

74. All references to a POSITA here are made pursuant to the definition above. However, my application of that definition is not a reflection of my agreement or disagreement with it. I reserve the right to provide my own opinion on the level of ordinary skill should a trial be instituted in this proceeding.

VIII. OPINIONS ON CLAIM CONSTRUCTION

75. I understand that Petitioner proposes constructions for two terms, “updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information” and

“configured for.” Petition, 10-11. Petitioner asserts that no other terms require construction. *Id.*

76. I understand that the Board has previously construed “location information” in Claim 7 as requiring the “actual location of the ‘detected user terminals’ within the cell in which the terminals are operating.” Petition, 12. The specification supports such a construction, as “location information” is specifically tied to position information obtained from a GPS module:

One embodiment of tuning the amount of cell list optimisation traffic is to use the location information from the user terminals as a selection criterion as defined in claim 7. **The location information may e.g. be obtained from a GPS module in the user terminal** or by means of measurements using the first and/or the second wireless access network. This location information can be useful e.g. in identifying where handover regions exist, and in solving location-specific outages or problems, e.g. dropped calls due to missing neighbour. It may also be useful when an operator changes configuration (optimisation of downlink power, antenna tilt, etc) and wants to measure the effect on the cells relevant for inter-RAT cell change or handover.

Ex. 1001, 5:25-37; *see also id.* 9:59-62. However, I understand that Petitioner has not proposed a construction for this term.

77. As the explicit construction of any of these terms is not necessary to address the assertions made in the Petition based on the information I have at this

time, I do not currently provide any opinion at this time on whether Petitioner's proposed constructions, or the prior construction of the Board, are accurate. My references to Petitioner's constructions should not be taken as endorsements of those constructions. I reserve the right to provide constructions of any of the claim terms should a trial be instituted.

78. Here, I have been asked to apply the plain and ordinary meaning to a POSITA of all claim terms at issue, as well as to apply Petitioner's proposed constructions where appropriate.

IX. OPINIONS ON VALIDITY

79. Petitioner and Dr. Almeroth rely on the combination of Amirijoo, TR-32.816, and Kazmi in asserting that the invention of Claim 7 was unpatentable because it was obvious to a POSITA at the time of invention. It is my opinion that although both Amirijoo, TR-32.816, and Kazmi relate to updating the Neighbour Cell List in cellular networks, none of the references, alone or in combination as asserted in Ground 2, render Claim 7 obvious.

80. More specifically, TR-32.816 discusses the input information that could be relevant and should be considered for optimizing the handover procedure and respectively the related neighbor cell list. *See, e.g.*, Exhibit 1006 at 11, 14. TR-32.816 does not disclose any methods or apparatus for the collection or management of the information for the purposes of updating NCL/NRL.

81. Amirijoo explores a specific situation related to establishing and maintaining NRLs in situations where handover may be performed between different frequencies or between cells belonging to different Radio Access Technologies (RATs). *See, e.g.*, Exhibit 1005 ¶ 25 (“Even though NRL management has been automated for one type or RAT, the problem of establishing NRLs for different RATs/frequencies has not been solved before.”), ¶ 26 (“What is needed therefore, and an object of this invention, are apparatus, methods, and techniques for establishing and managing inter-RAT measurements and information, such as that utilized by a neighbor relation list for inter-RAT/frequency mobility.”).

82. Even though Amirijoo discloses methods and apparatus for detecting new inter-RAT/frequency neighbor base stations and updating the existing NRL with information about those, the substance of its disclosure and the proposed methods and apparatus are around the specific arrangements that need to be provided for the mobile stations to be able to retrieve the neighbor base station CGI (Cell Global Identifier) with little or no disturbance of the ongoing traffic in the serving RAT/frequency. This is achieved by introducing the “transmission gaps” and respectively “reading gaps” which are used by the mobile stations for obtaining this information. *See, e.g.*, Exhibit 1005 ¶¶ 90-114; Figs. 5, 7-12, 14. Amirijoo’s disclosure is entirely focused on proposing different methods for measuring the CGI in an inter-RAT/frequency scenario. *See also id.*, claims 1-32. Therefore, Amirijoo’s

teachings are focused on acquiring the CGI of newly discovered inter-RAT/frequency neighbor cell and updating it in the serving cell's NRL with minimal disturbance of the ongoing traffic in the serving RAT/frequency, rather than detection and subsequent selection of specific user terminals suitable for performing measurements on available neighboring cells that may be candidates for handover, but are not yet accounted for and therefore present in the serving base station's NCL (as required by Claim 7).

83. Consequently, as further explained below, Amirijoo's methods and apparatus for detecting new inter-RAT/frequency neighbor base stations and acquiring their respective CGIs to update base station's NRL do not disclose or teach important components and functionality of the claimed system for updating neighbor cell lists of the '560 Patent related selecting and requesting only a part of the user terminals to perform measurements and report cell information on neighboring cells. This functionality allows the network to perform targeted measurements using particular user terminals for the purposes of updating the NCL as required by Claim 7 of the '560 Patent, and is missing in Amirijoo.

84. Kazmi, "Systems and Methods for Automatically Determining the Global Cell identifier of a Neighboring Cell," generally discloses methods for automatically updating a neighbor cell list based on radio signal metrics such as PCI (physical layer cell identifier) frequency, signal quality, and UE speed. Kazmi

discloses selecting particular user terminals, based on these metrics, to report neighboring cells. In Kazmi, this process is managed by the network. *See* Section VI.B.3.

85. Mach, “Wireless System Improvements Based on Location Positioning System Data,” addresses operational optimization of user equipment by using the UE location and speed. Mach generally teaches using the location and speed provided by user equipment (e.g., via a GPS receiver) as “an additional input or as a replacement input to estimated position/speed” to existing algorithms deployed in cellular networks. Ex. 1008 ¶¶ 38-40. That is, Mach teaches that the GPS information available in a user terminal may be used in existing protocols or algorithms, rather than the existing inputs for those algorithms/protocols, which used signal strength to estimate the terminal’s position or speed. Ex. 1008 ¶¶ 23, 39-40. Mach thus relates to how a user terminal should behave internally based on its location—for example, based on its particular location whether the user terminal should conduct more frequent measurements. *See* Section VI.B.4.

A. Claim 7

86. Claim 7 depends from Claim 1 and therefore includes all of its limitations. Claim 1 is reproduced below, using Petitioner’s nomenclature for the specific claim elements ([1pre], [1a], etc.):

1[pre] A system for updating a neighbour cell list in a

telecommunications architecture comprising a first wireless access network having a first wireless access node for which at least one first neighbour cell list is defined and a second wireless access network having a second wireless access node for which at least one second neighbour cell list is defined, the system comprising:

1[a] a detector configured for detecting user terminals to be transferred from the first wireless access node of the first wireless access network to the second wireless access node of the second wireless access network;

1[b] a selector configured for selecting a part of the user terminals;

1[c] a request generator configured for requesting from the first wireless access node one or more of the selected user terminals to report cell information of a plurality of wireless access nodes of at least one of the first wireless access network and the second wireless access network;

1[d] a receiver configured for receiving the cell information from the one or more of the selected user terminals;

1[e] and updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information.

87. Claim 7 is reproduced below:

7. The system according to claim 1, wherein the telecommunications system is further configured for receiving location information from one or more of the detected user

terminals and wherein the location information is used as a selection parameter for selecting the part of the detected user terminals.

Exhibit 1001, 12:60-65. Thus, Claim 7 further limits claim 1 with regard to the “selector” of claim 1[b]. Claim 1[b] requires “a selector configured for selecting a part of the user terminals,” while Claim 7 requires that the location information is used as “a selection parameter for selecting the part of the detected user terminals.”

B. Ground 2

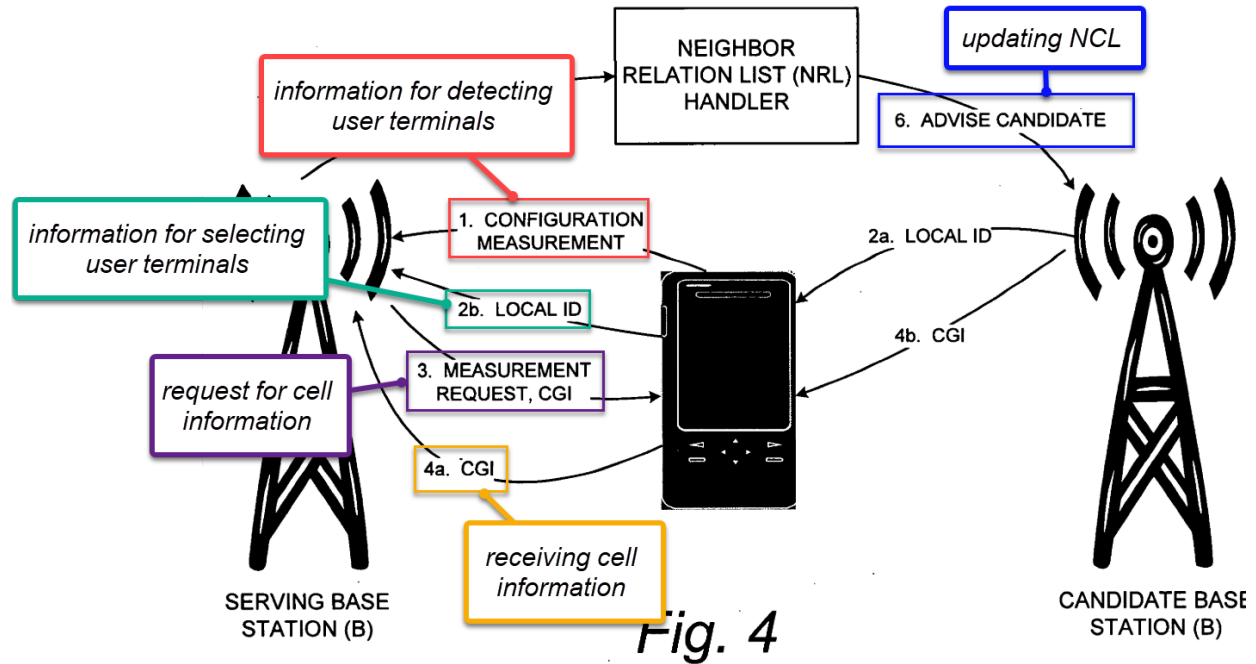
88. Under Ground 2, Petitioner asserts that Kazmi alternatively (to Ground 1) teaches element 1[b] and the limitations of claim 7. Petition, 46, 49-52. Thus, in Ground 2, Petitioner apparently relies on the disclosures of Ground 1 for all other elements of claim 7 (e.g., elements 1[a], 1[c], etc.).

1. Claim Element [1c]

89. Ground 2 relies on the Ground 1 combination of Amerijoo-TR-32.816 for this claim element. Petitioner asserts that Amirijoo “discloses that ... the serving base station ... sends a request for the Cell Global Identity (CGI) of the unknown candidate base stations.” Petition, 26-27.

90. Petitioner asserts that Amirijoo’s CGI measurement request, shown in act (3) of Fig. 4, is the request that satisfies the claim language. Petition, 27-28.

Petitioner’s annotated version of Figure 4, which identifies act (3) in purple, is reproduced below for reference:



91. As stated in the Petition, the CGI measurement request is sent from the serving base station to a mobile station that reported a neighbor base station with a local ID of which the serving base station had no prior knowledge. Petition, 27-28.

92. The CGI measurement request mapped by Petitioner is only for CGI measurement of a single neighbor base station having a local ID of which the serving base station had no prior knowledge. Ex. 1005 ¶ 81. Specifically, Amirijoo states that:

If the serving base station (BS) has no prior knowledge of a neighbor base station (BS) with the reported local ID, the serving

base station (BS) may send a **CGI measurement request to the mobile station (MS), as illustrated by act (3) in FIG. 4**. As illustrated by act (4 b) of FIG. 4, the mobile station (MS) measures the Cell Global Identity (CGI) of **the** candidate base station (BS) ... and (as illustrated by act (4 a)) reports **the** Cell Global Identity (CGI) to the serving base station (BS).

Ex. 1005 ¶ 81. Thus, the mapped request, sent in Figure 4 act 3, is not to report cell information of a plurality of wireless access nodes. Rather, this is a request sent only when the serving base station, after receiving the local ID from the mobile station (Fig. 4, act 2b.), determines that it has no prior knowledge of that specific neighboring base station. *Id.* ¶¶ 80-81. The request is then sent (Fig. 4, act 3) to that reporting mobile station, which measures the unique CGI of the specific unknown base station. This is a request to the mobile station that sent the unknown base station local ID that it provide the CGI of only a single candidate base station—specifically, the one having the previously unknown local ID.

93. However, this does not satisfy the claim language, which requires that the request, to one or more selected user terminals, be for “cell information of a plurality of wireless access nodes.” Petitioner apparently recognizes this issue, and thus cites Amirijoo ¶¶ 79-80, which state that “measurements from certain mobile stations chosen using the triggering conditions(s) ... are used to detect inter-RAT/frequency neighbors” and that “[t]he mobile station (MS) measures the signal

quality of surrounding inter-RAT/frequency base stations.” Petition, 28; Ex. 1005 ¶¶ 79, 80.

94. However, these passages in Amirijoo do not relate to the CGI measurement request sent in act 3 of Figure 4, but rather to the mobile station’s initial measurement and reporting of the signal quality of surrounding base stations, once Amirijoo’s triggering conditions are triggered. Ex. 1005 ¶¶ 79-80. Here, the mobile station is triggered to send measurements (after configured by the base station in advance). Thus, these passages relate to acts 1 and 2 of Figure 4, which Petitioner maps to the detector and selector of elements 1[a] and 1[b], respectively. Petition, 23-26. Only after this initial signal quality measurement of multiple base stations is reported back to the serving base station does the serving base station then issue a request for CGI information of a specific reported base station unknown to the serving base station, not for a plurality of such stations.

95. Therefore, the request mapped by Petitioner does not disclose the limitation of element 1[c], which requires “a request generator configured for requesting . . . one or more of the selected user terminals to report cell information **of a plurality of wireless access nodes**” Ex. 1001, 11:63-67. The claim requires a request to report cell information of a plurality of wireless access nodes, but the “Measurement Request, CGI” of Amirijoo relates only to a single, specific wireless access node, the one that is unknown to the serving base station. *See* Ex. 1005 ¶ 81.

96. The specification of the '560 Patent supports this understanding of the claim language (that is, that the request must be for a plurality of nodes, not simply a single unknown known as in *Amirijoo*). The '560 Patent relates to updating the neighbor cell list (NCL). *See* Section VI.A. The specification explains that “[a]t present, standardization does not allow mobile terminals to measure cells not present in the NCL.” Ex. 1001, 2:57-59. That is, user terminals (in the prior art) would report back to the serving base station only information about cells which are in the NCL. Therefore, the inventive system “performs a complete scan for all cells [in the first and/or second wireless access network] ... to obtain a complete picture of the available cells around the first wireless access node. This complete information containing the scan of all cells may then be used for updating the NCL(s).” *Id.*, 3:14-22. Thus, the specification repeatedly and uniformly references the reporting of cell information of “the plurality of wireless access nodes,” i.e., of more than one cell. *See id.*, Abstract, 2:26, 2:41, 2:50, 3:3, 3:6, 3:64, 4:15, 4:32, 4:40, 4:57, 4:65, 5:4, 5:11, 5:58, 5:66, 8:30, 8:32, 8:34, 8:45, 9:9. In discussing the “missing neighbour” effect (a neighbor missing from the NCL), although using the singular “neighbour,” the specification specifically states that “present embodiments may reduce this problem by instructing the user terminals to also scan for cell information of wireless access nodes ... being absent in the neighbour cell list.” *Id.*, 4:20-37. Thus, the

specification confirms throughout that this request is for information about more than one node or cell, not merely a single node or cell.

97. Because Amirijoo's CGI request relates only to a single wireless access node—the “candidate” base station selected for handover, when unknown to the serving base station—no matter how many requests Amirijoo's system sends, each request is only for CGI of a single, specific unknown node, not a plurality of nodes.

98. Therefore, a POSITA would have understood Amirijoo as teaching that the CGI request is a request sent from the serving base station to a mobile station to report information on a single base station that has been identified as a candidate for handover. This is not a plurality of nodes or base stations.

99. Based on the foregoing, it is my opinion that Ground 2 does not disclose this element. Therefore, I understand that it cannot render claim 7 unpatentable.

2. Claim 7

100. Petitioner asserts that Kazmi discloses using location information as a parameter for selecting the part of the detected user terminals required by claim 7. Petition, 51.

101. Petitioner identifies two disclosures in Kazmi which it alleged disclose the use of location as a selection parameter. First, Petitioner identifies Kazmi's statement that “the UE selected to obtain the GCI is a UE that is expected to be close to” the (single) unknown cell for which a global cell identifier is to be obtained by

the user equipment/mobile station. Petition, 51; Ex. 1007 ¶ 37. Second, Petitioner identifies Kazmi's use of the user equipment's speed. Petition, 51; Ex. 1007 ¶ 43. However, neither of these disclosures teach using location as a selection parameter.

a. Kazmi's "close to" disclosure

102. Kazmi refers to its processes 500 and 600 for adding the GCI of an unknown cell (103b) to the neighbor cell list for the serving base station (103a). Ex. 1007 ¶¶ 35-37. Kazmi references the thresholds used in these processes as being chosen to "provide sufficient assurance that cell 103b is indeed a neighbor cell that should be added to the neighbor cell list belonging to cell 103a." Ex. 1007 ¶ 37. For process 500, these thresholds are: 1) T1, a minimum count of the number of times the user equipment has sent a message containing an identifier associated with cell 103b; 2) T2, a minimum time elapsed since performing step 501; and 3) S, a maximum speed threshold for the speed of the user equipment, under which the serving base station would instruct the user equipment to obtain the GCI of cell 103b. Ex. 1007 ¶ 35. For process 600, these thresholds are 1) T3, a minimum count of the number of times all UEs have reported the PCI associated with cell 103b; and 2) T4, a minimum time elapsed since performing step 601. Ex. 1007 ¶ 36.

103. A POSITA would have understood that the thresholds in Kazmi provide assurance by filtering transient and noisy readings and reducing unreliable and false positive cases. Specifically, in the 500 process (per UE counter), only if the PCI is

reported enough times (T1) by the UE, and the UE is slow moving (resulting in reliable readings). This suggests a consistent, stable and non-transient signal (eliminating scenarios of fading or mobility effects). In the 600 process (global UEs counter or gc), the gc counter counts how many times the different UEs have reported the PCI of 103b. Once enough UEs (T3) have detected 103b, the system chooses the UE with the highest counter to retrieve its GCI. The rationale is when multiple UEs connected to 103a independently detect the same unknown PCI (103b), the probability that 103b is a legitimate neighbor rises substantially. These methods ensure that only genuinely adjacent cells like 103b are added to the 103a's neighbor list.

104. Based on these disclosures, a POSITA would have understood that these thresholds “provide sufficient assurance that cell 103b is indeed a neighbor cell that should be added to the cell list belonging to cell 103a,” because they reduce transient and noisy readings such that only genuinely adjacent cells like 103b are added to the 103a's neighbor list, i.e., reducing the number of unreliable and false positive readings.

105. Kazmi further states that “[a]dditionally, the UE selected to obtain the GCI is a UE that is expected to be close to cell 103b.” Ex. 1007 ¶ 37. Kazmi explains that “[t]his means radio conditions experienced by the selected UE with respect to cell 103b are expected to be good, thereby ensuring that the UE can obtain the GCI

of cell 103b relatively quickly.” Ex. 1007 ¶ 37. Thus, from this passage a POSITA would understand Kazmi as stating that good radio conditions generally indicate that the selected user equipment is “close to” the unknown cell 103b. But a POSITA would not have understood this reference to “close to” to refer to using location itself as a selection parameter, but rather that satisfying the referenced thresholds would indicate that the user equipment has good radio conditions with respect to cell 103b. Here, a POSITA would have understood the reference to “radio conditions” as referring to signal strength (which is also referred to by those of skill in the art as “radio distance” or the “communications range”). This is not the same as actual location, because while a UE may be geographically close to a particular base station, it may still have a bad or weak signal due to various issues, such as a null due to channel fading, signal fluctuations or blockage due to terrain or man-made obstacles, and interference.

106. Thus, this passage in Kazmi is not disclosing or suggesting the use of location itself as a parameter for selecting the user equipment, but stating merely an assumption or expectation that satisfying the indicated thresholds (in processes 500 and/or 600) should preferentially select user equipment that has good radio conditions (“expected to be close to” the unknown cell). The user equipment’s location is not used as a parameter, and if “close to” refers to actual location (which, as discussed, is not how a POSITA would have understood it) it is not a selection

parameter but merely a by-product of satisfaction of the indicated thresholds. Thus, Kazmi's statement that the UE is "expected to be close to" the unknown cell does not disclose or suggest to a POSITA the use of location as a selection parameter as required by Claim 7.

b. Kazmi uses speed as a selection parameter, not location.

107. Petitioner asserts that Kazmi discloses using "the speed at which the selected UE is moving" as a selection parameter for selecting particular user equipment "to instruct to obtain the GCI of a neighbor cell." Petition, 51; Ex. 1007 ¶¶ 41, 43, 46. I disagree that this disclosure demonstrates or suggests the use of location as a selection parameter.

108. Petitioner attempts to equate speed and location by asserting that speed is "calculated by determining the location of the user terminal at two different points in time to calculate how far the user terminal traveled in that elapsed time" and that "in order for the base station in Kazmi to calculate and use" speed as a selection parameter, "the base station would need to know and use the user terminal's location." Petition, 51.

109. I disagree with Petitioner's assertion that a base station must "need to know and use" the user terminal's location to calculate speed. I note that Petitioner appears to acknowledge this by stating that "a base station or user terminal typically does not include any mechanism for directly calculating a user's speed." Petition,

51. However, if this is “typically” the case, then necessarily at some times a base station may include such a mechanism for directly calculating a user’s speed. Such mechanisms were known to a POSITA and include for example utilizing the Doppler effect.¹ Therefore, I understand that Kazmi’s use of speed does not inherently disclose or suggest the use of location to calculate speed.

110. Petitioner’s analysis that “speed is instead calculated by determining the location of the user terminal at two different points in time to calculate how far the user terminal traveled in that elapsed time” assumes that the terminal travels in a straight line between two points and with a constant speed. Petition, 51. This is frequently not the case. Determining user equipment speed based on reported coordinates is in fact atypical, because there are other typical methods such as: 1) quantifying the doppler shift in signals arriving from the UE at the serving base station and using this shift to estimate UE speed; 2) quantifying the Time of Arrival (ToA) or Time Difference of Arrival (TDoA) between two reference signals arriving at the UE or at the base station; and 3) quantifying the Angle of Arrival (AoA) from

¹ See, e.g., Ex. 2004, U.S. Patent 6,259,919.

signals arriving from the UE at the serving base station that can be then used to determine/estimate the speed and direction of the UE.²

111. However, even assuming along with Petitioner that location was necessary to calculate speed, Kazmi still does not disclose or suggest using location as a selection parameter, but rather only discloses using speed. I can find no disclosure or suggestion in Kazmi to use location as a selection parameter, but only speed.

112. Petitioner further argues that it would have been obvious to a POSITA “that the selection process in Kazmi requests location information from the user terminal and uses it to calculate the ‘speed at which the selected UE is moving’ to be used as a *selection parameter*.” Petition, 51 (emphasis in original). Here, I note that Petitioner does not assert that it would have been obvious to use location as a selection parameter as required by Claim 7, but only that location information is used to determine speed, and that speed is then used as a selection parameter. Thus, I do not understand Petitioner here to argue that using location itself as a selection parameter was obvious.

² See Ex. 2003, 3GPP TS 36.305 V9.0.0 (2009-09), Release 9, September 28, 2009, at § 8.3 (pp. 39-40, 42), Annex B.1 (p. 47), B.4 (p. 50).

113. I also disagree that using location as a selection parameter was obvious, even if one assumes that using speed as a selection parameter required determining location. This is first because, even if true, there is ambiguity regarding the location. Specifically, whether the location is the starting point or the ending point of the travel, or is it in the direction to the base station or moving away from the base station. Because of this, the location cannot be determined by the speed parameter that is used in Kazmi's 500 process. Second, nowhere does Kazmi disclose or suggest using any location as a selection parameter. If a POSITA would have understood Kazmi as necessarily knowing the user terminal's location so that it could calculate speed, the lack of any suggestion in Kazmi to use the location, instead of speed, indicates to a POSITA that the use of location alone was not obvious. Otherwise, Kazmi would have suggested doing so. *Id.*

114. Based on the foregoing, a POSITA would not have understood Ground 2 to disclose or suggest using location as selection parameter for selecting the part of the detected user terminals, as required by Claim 7.

115. Therefore, in my opinion Ground 2 does not render Claim 7 obvious.

C. Ground 4

116. Under Ground 4, Petitioner asserts that Mach (Ex. 1008) in combination with the Ground 2 combination of Amirjoo-TR-32.816-Kazmi renders Claim 7 obvious. Petition, 58-64.

1. Claim element 1[c]

Ground 4 relies on the Petition's Ground 1 analysis for all elements of independent claim 1 that are part of Claim 7. Accordingly, the discussion and analysis set forth for Ground 2 above also applies to Ground 4. See Section IX.B.1.

2. Claim 7

117. As discussed above, Mach generally teaches using the user terminal's location (the location derived from GPS) instead of location information derived from signal strength. Ex. 1008 ¶¶ 23, 39-40. However, there is no disclosure or suggestion in Mach to use location information as a selection parameter as required by Claim 7.

118. Petitioner asserts that a POSITA would be motivated to use GPS location as disclosed in Mach to "provide a precise location of the user terminal that would allow Kazmi's selection criteria to determine whether it is "close to" the unknown cell." Petition, 60. Similarly, Petitioner asserts that Kazmi describes "*selecting certain user terminals* to request CGI information of an unknown neighbor cell based on certain *selection parameters*, such as whether the user terminal is 'close to' the unknown cell or the 'speed at which the selected UE is moving.'" Petition, 63 (emphasis in original). I disagree that this is how a POSITA would have understood Kazmi, as discussed above for Ground 2. Section IX.B.2.a. On the contrary, Kazmi does not disclose or suggest the use of location as a selection

parameter, nor does it teach using its selection criteria to determine location, but only expects that that location will be “close to” the unknown cell as a consequence of its processes based on threshold settings. *Id.* As discussed, Kazmi’s reference to “close to” refers to radio conditions. *Id.*; Ex. 1007 ¶ 37. Thus, while Mach does teach using GPS location information in place of location estimates based on signal strength in existing algorithms, Kazmi itself never teaches or suggests using location itself as a selection parameter but instead teaches using speed as one of multiple selection parameters. *See* Sections VI.B.3., IX.B.2.

119. Using GPS information from Mach in Kazmi to calculate speed as suggested by Petitioner is not an unreasonable interpretation of Mach. But doing so would merely provide a more accurate determination of speed than in Kazmi. Again, however, there is no disclosure or suggestion to use location, in either Mach or Kazmi, as a selection parameter instead of speed.

120. Nothing in Mach discloses or suggests that the location of the user terminals should be collected before performing measurements, and then used as a parameter to select certain terminals to perform the measurements, as required by claim 7. Similarly, there is nothing in Amirijoo-TR-32.816-Kazmi that references selecting only a subset of mobile devices based on their location information to perform measurements.

121. Based on the foregoing, the Ground 4 combination does not disclose or suggest the limitation of claim 7 requiring that location be used as a selection parameter. Therefore, Ground 4 does not render Claim 7 obvious.

3. Motivation to Combine and Reasonable Expectation of Success

122. I understand that Petitioner asserts that a POSITA would have been motivated to combine Amerijoo-TR-32.816-Kazmi (Ground 2) with Mach “because of the well-known benefits of using GPS location information to improve network operations.” Petition, 59. Petitioner also assert that a POSITA would have understood that using GPS location information as taught in Mach “would allow Kazmi’s selection criteria to determine whether it is ‘close to’ [an] unknown cell.” Petition, 60. Petitioner additionally asserts that a POSITA would be motivated to use GPS location information as a selection criteria “because a POSITA would understand that the signal strength of the user terminal to the serving base station or unknown neighboring base station is highly dependent on the precise location of the user terminal.” Petition, 60. Both of these motivations are based on Petitioner’s assertion that Kazmi “itself discloses that its selection criteria is used to determine whether a user terminal is ‘close to’ the unknown cell.” Petition, 60.

123. However, as discussed above, the assertion that Kazmi’s selection criteria determines whether a user terminal is “close to” the unknown cell is incorrect. *See* Sections IX.B.2.a., IX.C.2. As discussed, in Kazmi “close to” refers

to radio conditions, not actual location. To the extent “close to” can be interpreted as referring to actual location, Kazmi does not use location as a selection criteria, but the location is merely a by-product of satisfaction of Kazmi’s thresholds.

124. A POSITA would also not have been motivated to combine Mach with Amirijoo-TR-32.816-Kazmi because a POSITA would have understood that the references solve distinct and unrelated technical problems. Specifically, a POSITA would have understood Amirijoo as focused on user terminal execution procedures, Kazmi as directed to network-side logic focused on NCL accuracy, and Mach as focused on UE-side measurement behavior efficiency. A POSITA would have recognized that neither Amirijoo nor Kazmi disclose using actual location as a selection parameter for updating NCLs (or anything else). A POSITA would also have recognized that while Mach does disclose determining the actual location of a user terminal, it contains no teaching or suggestion of using that information for updating NCLs. Rather, Mach discloses how a user terminal may internally adapt its measurement behavior (for example, modifying measurement and reporting frequency) based on that location. *See* Section VI.B.4.

125. Thus, I disagree that a POSITA had a motivation to combine because the reference are directed to solving different problems. Amirijoo is directed to how a user terminal measures unknown cells, not selecting which user terminals should do so. And while Kazmi focuses on automatically updating the NCL based on radio

signal metrics (PCI frequency, signal quality, user terminal speed), Mach addresses UE-side operational optimization using location and speed. That is, Kazmi is about which user terminals should report neighbor cells (managed by the network), while Mach describes how a user terminal should behave internally based on location (e.g., measurement frequency).

126. In addition, Petitioner asserts that a POSITA would have reasonably expected the proposed combination to succeed because “Mach provides sufficient disclosure for a POSITA to implement its teachings” into the Ground 2 combination, and that “[u]sing such information as selection criteria would further be within the skill of an ordinary artisan, as calculating distances and speed using GPS location information ... would simply use rudimentary mathematics.” Petition, 61-62. Even if true, this analysis ignores the fact that Kazmi’s decision logic in choosing user terminals is entirely non-location based, and would need to be modified (with concepts not found in any reference) to include location as a selection criteria. The combination would thus have required a POSITA to replace Kazmi’s selection criteria (which was based on counters tied to signal metrics as discussed), add GPS data reporting from the user terminal to the base station, and implement entirely new decision logic on the base station (which determines the terminal speed) using the GPS coordinates. *See* Ex. 1007 ¶ 35 (“In step 510 base station 102a determines the speed of the UE”). This would not be a simple substitution or combination, but

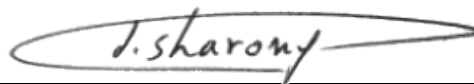
rather a fundamental architectural change. There is nothing indicating a reasonable expectation of success in making this change in the asserted references or in Petitioner's supporting evidence.

X. CONCLUSION

127. In addition to the opinions and evidence expressed herein, I reserve the right to rebut any arguments made or evidence presented in response to this testimony. I also reserve the right to supplement this testimony based on further investigation or analysis.

128. 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. I further declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: May 27, 2025

A handwritten signature in cursive script that reads "J. Sharony". The signature is written in black ink and is enclosed within a thin, horizontal oval-shaped line.

Jacob Sharony, Ph.D.