UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORD MOTOR COMPANY,
Petitioner,

v.

NEO WIRELESS LLC,
Patent Owner.

Case IPR2023-00763
Patent 10,447,450

EXHIBIT 2001
DECLARATION OF WILLIAM P. ALBERTH JR.

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I. INTRODUCTION

1. My name is William P. Alberth Jr. I am an expert in mobile telecommunications and wireless technology. As further detailed below and exhibited in my *curriculum vitae* attached as Exhibit 2002, I have over 25 years of experience in the design, development, implementation, and manufacturing of mobile telephones, smartphones, and other electronic equipment in addition to being an inventor on over 100 patents, including those related to telecommunications and wireless communications.

2. I have been retained as an expert witness to provide my independent opinion in regard to the matters at issue in *inter partes* review of U.S. Patent No. 10,447,450 ("the '450 patent") in IPR2023-00763. I have been retained by Neo Wireless LLC ("Neo"), the Patent Owner in the above proceedings. The Petitioner is Ford Motor Company. ("Ford").

3. For my work on this case, I am being compensated for my time at my standard hourly rate. I am also being reimbursed for expenses that I incur during the course of this work. My compensation does not depend on the substance of my opinions or the outcome of any issues in this case.

4. My analysis of the materials produced in this matter is ongoing and I will continue to review any new material as it is provided. This declaration

represents only those opinions I have formed to date. I reserve the right to amend or supplement my opinions based on additional documents or evidence I am presented, including without limitation any arguments or expert declarations advanced by VW in this case.

II. QUALIFICATIONS

5. I am qualified to be an expert witness in this matter as I possess the requisite knowledge, skill, experience, training and education relating to the subject matter covered by the asserted patents.

6. In summary, I have over 25 years of experience in the design, development, implementation, and manufacturing of mobile telephones, smartphones, and other electronic equipment. The majority of my career was spent at Motorola where my final role was serving as the Chief Technology Officer for Motorola Mobile Devices. I held that position from 2007 until August 2012, and in that role, I led the development of differentiating technology that was integrated into Motorola's commercial mobile telephone products.

7. During the early stages of my career with Motorola (between 1987 and 2006, covering the Priority Dates of the '450 patent) I was employed as an engineer, working on developing cutting-edge chipsets to enable cellular devices, and in the development of many products that changed the way people

communicated, including the development of the Motorola MicroTAC, StarTAC and RAZR mobile telephones. I worked on or directed work on evaluating transmitter technologies and architectures to mitigate the effects of PAPR (Peak to Average Power Ratio) on the current drain of the devices. Some of the techniques evaluated include for example: pre-distortion; envelope following; EER (Envelope Elimination and Restoration); and Adaptive biasing.

8. My educational background includes a B.S. in Electrical Engineering from the University of Illinois Urbana-Champaign (1985), and a M.S. in Electrical Engineering from Illinois Institute of Technology (1992).

9. I am inventor or co-inventor on over 100 patents issued or pending, including patents related to my work on transmitter architectures involved for wireless communications.

10. In forming my opinions here, I am relying on my education and experience, including my over 25 years of experience in a variety of technologies and industries related to various wireless communications systems.

11. Additional information concerning my background, qualifications, publications, conferences, honors, and awards are described in my Curriculum Vitae, a copy of which is attached with this Report as Exhibit 2002.

III. LEGAL STANDARDS

12. I am not a lawyer, and I do not intend to offer any opinions as to the interpretation of the law. When considering the ’450 patent and stating my opinions, I rely on the following legal standards as described to me by the attorneys for Neo Wireless.

A. Priority Date Of Patent.

13. I understand that the analysis of alleged obviousness of the Patent should be performed from the perspective of a POSITA as of the priority date of the Patent. Through a series of continuations, the Patent claims priority to September 28, 2005. My opinions in this matter are from the perspective of a POSITA as of that date; however, my opinions do not change if the priority date is slightly changed.

B. Level Of Ordinary Skill In The Art.

14. My opinions in this declaration are based on the understandings of a person of ordinary skill in the art, as of the time of the invention. I understand that the person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. By “relevant,” I mean relevant to the challenged claim of the ’450 patent.

15. I understand that various factors should be considered when determining the person of ordinary skill in the art in connection with a particular patent. I understand that these factors include, without limitation, the type of problems encountered in the art, the prior solutions to those problems found in the prior art references, the rapidity with which innovations are made, the sophistication of the technology, the level of education of active workers in the field, and my own experience working with those of skill in the art at the time of the invention.

16. I am readily familiar with the level of ordinary skill in the art as of the priority date of the Patent. My qualifications at that time far exceeded that of a POSITA, and I had worked with, as well as supervised, many POSITA's throughout my work in the field.

17. Dr. Cooklev opines that a POSITA:

> A POSA at the time of the earliest claimed priority date, September 28, 2005, would have a bachelor's degree in electrical engineering, computer engineering, computer science, or an equivalent field, or an advanced degree in those fields, as well as at least 3-5 years of academic or industry experience in mobile wireless communications, or comparable industry experience.

Ex. 1003 [Cooklev-Decl.] ¶ 36.

18. I disagree with Dr. Cooklev's proposed level of ordinary skill. I also understand that Dr. Cooklev's proposed POSITA exceeds the level of ordinary skill in the art adopted by the Board in an earlier proceeding where the Board found that the proper level of ordinary skill in the art is only a "Bachelor's degree in an academic area emphasizing electrical engineering or a similar discipline," and only "two years of experience in the field working with, teaching, or researching wireless communication networks." *Dell Inc. v. Neo Wireless LLC*, IPR2021-01486, Paper 10, 11-12 (PTAB, Mar., 16, 2022).

19. I substantially agree with the level of ordinary skill in the art adopted by the Board in IPR2021-01486. In 2005 many of the professionals working in the wireless communications space had only a couple years of experience after having graduated with an undergraduate degree in electrical engineering or a similar discipline. Mobile communications was a fast-growing field that necessarily attracted many newcomers to the field. Certainly it was uncommon for working professionals in the field to have doctorate degrees and such advanced education would be typical of someone with more than ordinary skill in the art.

20. A POSITA in 2005 was typically involved in deploying and configuring wireless communication equipment to increase the reach of commercial wireless networks, increase their capacity to handle more users, and

also allow for the deployment of new applications requiring more bandwidth. A POSITA would not have been required to design a wireless system from the ground up. This is because many important parameters and design choices had already been made by standards setting committees. Thus, a POSITA would have had enough knowledge of the technology to understand and deploy equipment adhering to these technical specifications but would have a very limited ability to change the fundamental specifications of the network.

21. Based on my experience, education, and training, as of September 2005, I met the definition of a POSITA adopted by the Board in IPR2021-01486, as well as the definition proposed by Dr. Cooklev. My qualifications at that time far exceeded that of a POSITA, and I had worked with, as well as supervised, many POSITA's throughout my work in the field. My opinions concerning the '450 Patent claims and the prior art are from the perspective of a POSITA, as set forth above.

22. As further discussed below, my opinions as stated in this declaration are valid even if the Board adopts a slightly different level of ordinary skill in the art.

C. Claim Construction.

23. I understand that claims in a patent-at-issue in an IPR are generally interpreted according to the district court-type claim construction.

24. I further understand that claim terms are interpreted as they would have been interpreted by a person of ordinary skill in the art at the time of the invention, in light of the specification and the patent's prosecution history in the patent office.

D. Obviousness Legal Standard.

25. I understand that a patent claim is unpatentable if the claimed invention would have been obvious to a person of ordinary skill in the art at the time of the invention.

26. I understand that an obviousness analysis involves comparing a claim to the prior art to determine whether the claimed invention would have been obvious to a person of ordinary skill in the art at the time of the invention in view of the prior art and in light of the general knowledge in the art as a whole. I also understand that obviousness is ultimately a legal conclusion based on underlying facts of four general types, all of which must be considered: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) any objective indicia of

non-obviousness, including any praise of the invention. Objective indicia of non-obviousness may include, for example, commercial success of an embodiment, a long-felt need, skepticism, failure by others to find the solution provided by the claimed invention, copying by others of the subject matter of the claim invention, unexpected results of the claimed invention, acceptance of others and industry praise, and licensing of the patents.

27. I also understand that obviousness may be established under certain circumstances by combining or modifying the teachings of the prior art. However, I have been informed that a claim is not proved obvious merely by demonstrating that each of the elements was independently known in the prior art. I have been informed that many, if not all, inventions rely on building blocks already previously known, and claimed discoveries almost of necessity will likely be combinations of what is already known. I have been informed that it is important to identify whether a reason existed at the time of the invention that would have motivated a person of ordinary skill in the art in the relevant field to combine the known elements in the way the claimed invention does. Specific teachings, suggestions, or motivations to combine any first prior art reference with a second prior art reference can be explicit or implicit, but must have existed before the date of purported invention. I understand that prior art references themselves may be

one source of a specific teaching or suggestion to combine features of the prior art, but that such suggestions or motivations to combine art may come from the knowledge that a person of ordinary skill in the art would have had.

28. I understand that a reference may be relied upon for all that it teaches, including uses beyond its primary purpose, but also including teachings that lead away from the invention. I understand that a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, although the mere disclosure of alternative designs does not teach away.

29. I further understand that whether there is a reasonable expectation of success in combining references in a particular way is also relevant to the analysis.

30. I understand that it is improper to use hindsight to combine references or elements of references to reconstruct the invention using the claims as a guide. My analysis of the prior art is made from the perspective of a person of ordinary skill in the art at the time of the invention.

31. I am not offering any legal opinions in this declaration nor am I qualified to do so. I only consider such legal standards in framing my opinions and conclusions as well as placing assertions made by Petitioner in the Petition into the proper context. Additionally, from a subject matter perspective, I understand that

the petitioner always has the burden of persuasion regarding a challenge of patentability of an invention under an inter partes review.

IV. CLAIMS-AT-ISSUE

32. I understand that Petitioner has challenged claims 7 and 11 of the '450 Patent under a single ground of obviousness based on the combination of Park and IEEE 802.16-2004. Pet., 9.

33. Of the challenged claims, only claims 7 is independent. In this declaration, I have only been asked to address arguments relating to the independent claim and, therefore, I do not address dependent claim 11.

V. OPINIONS

A. IEEE 802.16-2004 Alone Or In View Of Park Does Not Support Mobile Users.

34. Claim 7 recites a "mobile device configured to: receive an identifier from a base station in a cell in which the mobile device is operating …."). Ex. 1001 ['450 Pat.] cl. 7.

35. I understand that Petitioner relies on the IEEE 802.16-2004 as modified by Park's resource allocation scheme for the disclosure of the claims. Pet., 14 ("A POSA would have been motivated to combine the teachings of Park

and 802.16-2004 as proposed …"); Ex. 1003 [Cooklev-Decl.] ¶ 77 ("A POSA would have considered it obvious to implement Park using 802.16-2004.").

36. It is my opinion that the IEEE 802.16-2004, either alone or as modified by Park, does not disclose a "mobile device." It was well-known in the field and to a POSITA that the IEEE 802.16-2004 standard were directed exclusively at stationary systems and did not support mobile users. The title of standard itself states that it is the "Standard Air Interface ***for <u>Fixed</u> Broadband Wireless Access Systems***," not for mobile systems:

> **Part 16: Air Interface for Fixed Broadband Wireless Access Systems**

Ex. 1006 [802.16-2004] 0001 (Title).

37. Its abstract states that ***"[t]his standard specifies the air interface of <u>fixed</u> broadband wireless access*** (BWA) systems supporting multimedia services." Ex. 1006 [802.16-2004] 0004 (Abstract).

38. The word "mobile" does not appear in the standard even once.

39. This is also readily confirmed by various literature in the field, such as Ex. 2020 [Eklund-Article], which was co-authored by Carl Eklund, chair of the MAC task group that developed the IEEE 802.16 medium access protocol, and Roger Marks, chair of the IEEE 802.16 working group on broadband wireless

access. Ex. 2020 [Eklund-Article] 107 (Biographies). Eklund provides a technical overview of the IEEE 802.16 standard. It explains that "[t]he broadband wireless access industry," including the IEEE 802.16 standard, "provides high-rate network connections to ***stationary sites***." Ex. 2020 [Eklund-Article] 98 (Abstract). Eklund further explains the purpose of the IEEE 802.16 standard at the time, which did not require mobile users. The IEEE 802.16 standard provided network access to buildings through exterior antennas installed on the buildings as an alternative to cable access networks to provide the last-mile connection between the buildings and the larger metropolitan network infrastructure:

> As currently defined through IEEE Standard 802.16, a wireless MAN provides network access to buildings through exterior antennas communicating with central radio base stations (BSs). The wireless MAN offers an alternative to cabled access networks, such as fiber optic links, coaxial systems using cable modems, and digital subscriber line (DSL) links.

Ex. 2020 [Eklund-Article] 98. WirelessMAN™ referenced in Eklund refers to the air interface for the IEEE 802.16, and stands for Wireless Metropolitan Area Networks. *Accord*, Ex. 1006 [802.16-2004] 0001 (Local and Metropolitan Area Networks).

40. Once the building was connected to the larger metropolitan network through 802.16, the individual users inside the building could access the network through other standards such as WLAN 802.11, *i.e.*, the typical Wi-Fi network. *Id*. ("In this scenario, with WirelessMAN technology bringing the network to a building, users inside the building will connect to it with conventional in-building networks such as, for data, Ethernet (IEEE Standard 802.3) or wireless LANs (IEEE Standard 802.11).").

41. The IEEE 802.16 family of standards (including 802.16-2004) did not support mobile users until version 802.16e, approved on December 7, 2005. *See* Ex. 1014 [802.16(e)] 3. This is confirmed by, for example, another article authored by Roger Marks. Dr. Marks explains that the 802.16 working group "began a new project" to "add support for mobile terminals" in 2002. Ex. 2022 [Marks] 74. While the project "brought in a large number of participants and new technology ideas," it was not until 2005 when the details, including feasibility and desirability, were worked out and support for mobile terminals were supported through the IEEE 802.16e amendment. *Id*.

42. A book authored by Dr. Eklund, Dr. Marks and others on the IEEE 802.16 standard, placed into evidence by Petitioner, also supports the above.

Specifically, the book expressly confirms that IEEE 802.16-2004 was directed at fixed users, and it was the amendment in IEEE 802.16(e) that allowed mobility:

> The current version of its fixed wireless standard was most recently updated as IEEE Std 802.16-2004 [B20], and an amendment adding mobility support (IEEE Std 802.16eTM-2005 [B24]) was published in late 2005.

Ex. 1025 [Eklund-Book] x[1].

43. The length of the project to add mobility to IEEE 802.16 was, at least in part, due to the fact that both feasibility and desirability of adding mobility to the IEEE 802.16 standard were uncertain. As the "Call for Contributions" of the project noted, the working group had to "address enhancements to the IEEE 802.16a PHY/MAC to support mobile operation, including cell-to-cell and sector-to-sector handoff capability as well as other protocol and MIB support." Ex. 2021 [Kiernan] 1. The first task of the working group was to determine if adding mobility to IEEE 802.16 was even feasible:

> The initial output of the Study Group is expected to be a series of studies and analyses that would indicate ***whether such a capability can be***

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[1] I cite native page numbers of Ex. 1025 [Eklund-Book] for the Board's convenience.

> ***provided*** within the basic confines of the 802.16a PHY/MAC, what level of mobility (pedestrian, vehicular) could be supported, and the extent of the PHY/MAC changes required to support it. It is NOT the current intent of the Study Group to develop a PAR. However, ***if the technical studies indicate that 802.16a enhancement for mobile operation is feasible***, development of a PAR can be expected at some future date.

Ex. 2021 [Kiernan] 1. Note that PAR is a Project Authorization Request.

44. The Call for Contributions lists more than ***a dozen*** bullet points of "technical issues" that needed to be addressed to add mobility to IEEE 802.16. Ex. 2021 [Kiernan] 1-2. In fact, even after approving the IEEE 802.16e amendment in 2005, the working group continued its work on other "critical issues" to support mobility, leading to IEEE 802.16f amendment in 2005 and IEEE 802.16g amendment in 2007. Ex. 2022 [Marks] 74. In short, it was not until at least December 7, 2005 that the IEEE 802.16 family of standards could support mobile users, with many of the details being worked out even later than 2005.

45. Ex. 1025 [Eklund-Book] also confirms this:

> As the working group's attention turned to mobility, it decided that network management would be an increasingly critical issue. The Network Management (NetMan) Task Group, chaired by Phil Barber, was initiated to address such concerns. The NetMan group took on two projects: IEEE P802.l6f and IEEE P802.l6g.

> IEEE Std 802.16fTM, a management information base (MIB) for fixed systems, was approved in September 2005. IEEE P802.16g is a complex activity on "management plane procedures and services." Approval is not expected until 2007. In the meantime, the working group began planning in late 2005 to follow up IEEE Std 802.16f with a new MIB project for the mobile case. This was launched as IEEE P802.16i in December 2005.

Ex. 1025 [Eklund-Book] 26.

46. As Ex. 1025 [Eklund-Book] also confirms, the substantial modifications necessary to make the IEEE 802.16-2004 mobile was, at least in part, due to the fundamental differences in the technical design requirement for fixed and mobile stations:

> Apart from the regulatory requirements, fixed and mobile devices differ in technical design. Fixed networks may (in some cases) use high-power transmitters and involve high-gain, directional rooftop antennas with a clear LOS. This situation provides for a simple propagation channel. Although some fixed-system designs are based on more challenging links, to account for indoor antennas with minimal installation problems, the channel is relatively static. Mobile wireless networks, on the other hand, may involve a handheld subscriber unit with a small, omnidirectional antenna; therefore, the channel may be quite poor. Furthermore, since the device may be in rapid motion, the system must accommodate a rapidly varying channel. On the PHY

> level, the system must deal with changes in the radio frequency (RF) signal that are the result of the mobile device's movement, such as large-scale fading and Doppler. These phenomena will be discussed later in this chapter.
>
> Effective mobile communication requires optimization at both MAC and PHY levels. An important additional requirement, with both PHY and MAC ramifications, is fast handover. For example, a mobile device communicating with a fixed BS must establish communication with a second BS, without disconnecting from the first, as it goes out of range of the first device. Handover usually involves support from components outside the MAC and PHY. However, the MAC must include basic support for handover, working in conjunction with other functions

Ex. 1025 [Eklund-Book] 33-34.

47. I have also reviewed Park and none of the modifications it proposes for the IEEE 802.16-2004 modify the standard to be mobile. Specifically, Park modifies the DL-MAP message to allocate resources in a portion of the frame differently than IEEE 802.16-2004. Ex. 1005 [Park] [0055]. This modification, and related changes proposed in Park, do not affect whether or not IEEE 802.16-2004 is mobile.

VI. CONCLUSION

48. I understand that my opinions discussed above support a legal conclusion that the challenged claims are nonobvious.

I hereby declare that all statements made herein of my own knowledge are true and all statements made herein on information and belief were and are believed by me to be true, and that all statements herein were and are 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 and that any such willful false statements may jeopardize the validity of the application or any patents issued thereon.

August 17, 2023 SIGNED: William Alberth

William P. Alberth, Jr.