

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,
T-MOBILE USA, INC., AT&T SERVICES, INC.,
NOKIA OF AMERICA, CORP., ERICSSON INC., AND GOOGLE LLC

Petitioners,

v.

PEGASUS WIRELESS INNOVATION LLC
Patent Owner.

U.S. Patent No. 11,540,272
Issue Date: December 27, 2022
Title: METHOD AND DEVICE FOR ALLOCATING DATA CHANNEL
RESOURCE FOR NEXT-GENERATION WIRELESS ACCESS NETWORK

Inter Partes Review No.: IPR2025-00137

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO.
11,540,272
UNDER 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-.80, 42.100-.107**

DECLARATION OF CRAIG BISHOP

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I. INTRODUCTION

I, Craig Bishop, declare as follows:

1. I have been retained as an independent expert witness on behalf of Nokia of America Corp., Ericsson Inc., AT&T Services, Inc., Cellco Partnership d/b/a Verizon Wireless, Google LLC, and T-Mobile, USA, Inc., (to whom I will refer to as Petitioners) for this inter partes review proceeding (which I may refer to at times as an “IPR”).

2. I am being compensated for my work in this matter at my accustomed hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the results of my study, the substance of my opinions, or the outcome of this matter.

3. In the preparation of this expert report I have reviewed the documents cited herein, each of which is a type of material that experts in my field would reasonably rely upon when forming their opinions, as well as all of the Appendices attached hereto.

4. In forming the opinions expressed within this expert report, I have considered:

- The appendices listed above; and

- My own academic background, knowledge, and professional experiences in the field of wireless communications.

5. Although I have attempted to organize the information presented in this report into helpful sections and/or divisions, my opinions are supported by the information in the report in its entirety.

II. QUALIFICATIONS

6. My complete qualifications and professional experience are described in my *curriculum vitae*, a copy of which is attached as **Appendix 1**. The following is a summary of my relevant qualifications and professional experience.

7. I earned my Bachelor of Electronic Engineering degree with Honors from Polytechnic of Central London in 1989. In 2006, I earned my MSC in Computer Science with Distinction from the University of Kent.

8. After graduating with my first degree, I worked as an operations engineer at the British Broadcasting Corporation (BBC) for 4 years, then as a civil servant at the UK Radiocommunications Agency until 1996, during which time I became involved in telecommunications standardization in the European Telecommunication Standards Institute (“ETSI”), working in particular in Technical Committee Radio Equipment and Systems (TC RES2) concerned with the standardization of Private Mobile Radio (PMR). From 1994 through 1996, I acted

as Rapporteur for voice and data related PMR standards ETS 300 113, ETS 300 219 and ETS 300 390. I participated as the only TC RES2 delegate on behalf of the UK Radiocommunications Agency, generating proposals in support of UK administration and business requirements, downloading and reviewing other meeting input documents, and proposing changes as necessary to ensure input documents and the resulting specifications were in line with said requirements.

9. In 1996, I joined Samsung Electronic Research Institute as a Senior Standards Engineer where I worked for 16 years, eventually becoming Director of Standards and Industry Affairs in 2011. My work at Samsung mainly focused on the standardization of Global System for Mobile Communications (GSM)/ General Packet Radio Service (GPRS), Universal Mobile Telecommunications System (UMTS), the IP Multimedia subsystem (IMS), and Long-Term Evolution (LTE)/ Evolved Packet System (EPS) systems. Initially, I participated in ETSI Special Mobile Group (SMG) committees SMG1, SMG2, SMG4, SMG5, and SMG9, and relevant UMTS related sub-committees working on the air interface radio access network protocols, service, and terminal aspects of UMTS and GSM/GPRS until 1999. In particular, I was a participant in the ETSI SMG2 meetings leading up to selection of Wideband Code Division Multiple Access (WCDMA) as the radio access technology for the Frequency Division Duplex (FDD) mode of UMTS.

10. Beginning in 1998, I worked as a Principal Standards Engineer on the 3rd Generation Partnership Project (3GPP) on UMTS. I attended the inaugural 3GPP Technical Specification Group (TSG) meetings held in December 1998, and I began attending Working Group (WG) meetings in 1999. Specifically, I was a regular participant in Radio Access Network (RAN) WG1, Services & System Aspects (SA) WG1, Terminals (T) WG2, but I also attended TSG RAN and T plenary meetings and sometimes other Working Groups and covering similar technical aspects as in my previous work in ETSI. As an example, RAN WG2 was, and is, a Working Group responsible for the specification of layer 2 and layer 3 Radio Resource, protocols for the UE. As part of this work, I would prepare meeting contributions in support of Samsung's research and development activities. Also, by way of preparation for each meeting, I would download all contributions and review those of interest to Samsung, and where necessary, prepare additional input to the meeting based on said review.

11. Beginning in 2000, I acted as project manager and then as system engineering manager at Samsung, providing technical requirements for the team working on Samsung's UMTS modem development. This involved scrutiny of ongoing standardization work, particularly in RAN WG1, RAN WG2, and TSG Core Network (CN) WG1, from which I would download, and assess the impact of,

contributions on Samsung's development projects, ensuring that Samsung's development team was kept informed about the latest developments as layers 2 and 3 of the UMTS standard were stabilized.

12. During this period, in addition to authoring and presenting technical contributions for the 3GPP standard, and producing technical requirements for the radio modem, I acted as Rapporteur for 3GPP Technical Reports covering User Equipment ("UE") capability requirements (3GPP TR 21.904) from 1999–2000, and the Evolution of the 3GPP System (3GPP TR 21.902) in 2003 (the first Study Item to consider the 3GPP system beyond UMTS towards LTE/EPS).

13. In 2005, I became Head of Advanced Technologies, Standards, and Regulation (ATSR) at Samsung. In addition to my managerial duties which included responsibility for standards, research, and regulatory engineers—including three standards engineers who were regularly attending 3GPP RAN WG2 and Core Network and Terminals (CT) WG1 Working Groups—I personally continued to work on 3GPP standardization issues. From 2005 until 2008, I regularly attended and participated in SA WG2 meetings, mainly focusing on IP Multimedia Subsystem (IMS) including voice over IMS but also looking at wider Evolved Packet System (EPS) related issues. From 2008 until 2011, I regularly attended and participated in SA WG1 meetings. I also attended SA plenary meetings from 2008 until I left

Samsung in 2013. As well as generating contributions in support of Samsung's research and development as preparation for each meeting, I would download and review documents from other 3GPP members, identifying those of interest to Samsung and, where necessary, preparing additional contributions on behalf of Samsung. The work required a sound working knowledge of the broader 3GPP system to ensure effective management of the ATSR team, effective participation in meeting discussions, expert assessment of third-party standards contributions, and provision of implementation guidance to Samsung developers.

14. From 2005 until I stopped attending SA WG1 meetings in 2011, I authored and presented over 100 contributions to SA WG2 and SA WG1 meetings at 3GPP and appeared as an author/co-author on 18 patent applications related to User Equipment operation in the IMS and the 3GPP Core Network.

15. In 2011, I became Director of Standards and Industry Affairs at Samsung, and in November of that year I was elected to the Board of ETSI on which I served for a term of 3 years until November 2014. In this position I gained further perspective on the organisation, management, and activities of ETSI and its Technical Committees and Partnership Projects including 3GPP.

16. Since leaving Samsung in January 2013, I have formed my own consulting company which is a member of ETSI, and as part of various projects

undertaken, I have continued to regularly access the ETSI and 3GPP document servers, and to keep abreast of ETSI and 3GPP document handling and publication practices.

17. Through my extensive work in ETSI and on 3GPP standardization issues over the years, I have become very familiar with ETSI and 3GPP practices for when and how the technical standards (including revisions thereto) and other standards-related contributions are made publicly available, including in the 1999–2012 timeframe when I was attending or monitoring various 3GPP Working Groups, including RAN WG1 and RAN WG2, and since 2013 in support of my work as an independent standardisation consultant.

18. For purposes of my analysis in this declaration, I have been informed that a person of ordinary skill in the art (“POSITA”) would have been a person with knowledge of the relevant 3GPP standards at the time. That person would have had at least a Bachelor of Science degree in electrical engineering, computer engineering, or related discipline and had at least two years of experience in a field involving wireless communications.

III. PUBLIC AVAILABILITY OF 3GPP STANDARDS PROPOSALS AND OTHER DOCUMENTS

19. Based on my years of experience working in various capacities in 3GPP and on 3GPP standards issues, I am familiar with the regular business practices of

the 3rd Generation Partnership Project (3GPP) relating to technical documents including specifications, draft standards and proposals, and standards-related technical contributions, as well as the business practices through which 3GPP makes these documents public.

A. Prominence and Purpose of 3GPP

20. 3GPP was inaugurated in December 1998 to produce Technical Specifications and Technical Reports for the Universal Mobile Telecommunications System (UMTS), a 3G Mobile System based on evolved GSM core networks and a new radio access network known as UTRA (UMTS Terrestrial Radio Access). **Appendix 2** at 2, 3 (“[3GPP] Partnership Project Description”); **Appendix 3** at 1; **Appendix 4** at 5. At that time, various standards organisations agreed to cooperate to produce a “complete set of globally applicable Technical Specifications” that would then be transposed into standards by the relevant standardization bodies (also known as Organizational Partners). **Appendix 2** at 3, 5 (“[3GPP] Partnership Project Description”). 3GPP “attracted a very strong commitment from organisations and companies around the world, reflecting the truly global nature of the project.” **Appendix 4** at 7.

21. 3GPP is a global initiative partnership made up of Organizational Partners, Market Representation Partners, and Individual Members. **Appendix 5** at

8, 9; **Appendix 2** at 10. Today, 3GPP unites seven telecommunications standard development organisations (“Organizational Partners”) from around the world: the Association of Radio Industries and Businesses (ARIB) and the Telecommunication Technology Committee (TTC) from Japan, the China Communications Standards Association (CCSA) from China, the Telecommunications Standards Development Society, India (TSDSI) from India, the Telecommunications Technology Association (TTA) from Korea, the European Telecommunications Standards Institute (ETSI), and the Alliance for Telecommunications Industry Solutions (ATIS) from the United States. These Organizational Partners are regional standards organisations that have the authority to define, publish, and set standards for their respective regions. **Appendix 2** at 12. 3GPP also includes “Market Representation Partners” that represent various industry perspectives and offer market advice. **Appendix 5** at 9 (3GPP Working Procedures, “Market Representation Partnership”); **Appendix 2** at 14; **Appendix 4** at 5. Additionally, 3GPP includes individual member companies (“Individual Members”) that participate in 3GPP through their membership of a 3GPP Organizational Partner. **Appendix 5** at 9 (3GPP Working Procedures, “Individual Membership”); **Appendix 6** at 5 (textbook including a chart showing 3GPP structure at the time of publication); **Appendix 8** at 9, 10. As an example of how prominent 3GPP was (and remains) in the industry,

there were 566 Individual Members in 2016. **Appendix 7** at 9 (3GPP Project Coordination Group document showing 3GPP membership numbers to 2018). There were 835 individual members as of August 2024. **Appendix 9**.

22. As noted in paragraph 20, a primary goal of 3GPP is to provide an environment to produce Technical Specifications and Technical Reports that define and standardize technologies covering cellular telecommunications networks, including User Equipment or Mobile Device (UE) technologies, Radio Access Network (RAN) technologies, Core Network (CN) technologies, and service and system capabilities such as work on codecs, security, and quality of service. The specifications also provide hooks for interworking with non-3GPP networks including, but not limited to, Wi-Fi networks. **Appendix 2** at 32–40; **Appendix 3** at 2.

23. Given the prominence of 3GPP in the wireless communication industry, beginning in 1999 and continuing through today, interested POSITAs were tracking the developments of the latest 3GPP specifications and reports to ensure timely development of products and services by their companies that were consistent with the standards being developed. In other words, it is my opinion that a POSITA would have to be familiar with 3GPP and with the specification-related documents produced as part of the 3GPP process in order to properly perform his or her job.

Without access to and knowledge of the 3GPP documentation, including, for example, the substantive contents of 3GPP technical specifications, an engineer could not develop products that were interoperable with the worldwide 3G, 4G, and 5G standards. Because 3GPP documents were an important aspect of a POSITA's professional experience, textbooks and articles about cellular communications commonly directed readers to the 3GPP website for information regarding standards development. **Appendix 4** at 9 (directing readers to the 3GPP website at the conclusion of the chapter on the success of 3GPP in the standards development process). As a POSITA myself, I would regularly visit the 3GPP website for the latest developments in mobile communications standards setting and refer colleagues involved in the development of such devices to the 3GPP website as a valuable reference.

24. My personal experience at Samsung confirms 3GPP's prominence in the wireless industry. For example, engineers and managers at Samsung who were responsible for implementing 3GPP compliant modem software (and who were not attending 3GPP meetings or involved with development of the 3GPP standard in any direct way) would often enquire as to which version of a given 3GPP specification they should be developing. Further, between 2000 and 2004, part of my role at Samsung involved advising software engineers implementing the 3GPP standard on

the correct interpretation of the specifications and ensuring that they were made aware of any changes and proposals made during the 3GPP standards development process that would impact their work. I also for a time maintained an internal company database that tracked 3GPP-approved changes to help the software engineers at Samsung implementing the 3GPP standard more readily stay informed as to changes that would impact their work. The database also included links to relevant 3GPP documents so that engineers could access the documents directly. In short, the technical output of 3GPP was, and continues to be, well known at 3GPP member companies, even by engineers who were not directly involved with designing the 3GPP system or contributing to the 3GPP standard process.

B. 3GPP's Policy of Making Documents Public

25. 3GPP's policy was to make 3GPP documents available to the public, including to interested POSITAs. The free availability of 3GPP documents to any interested member of the public was widely recognized in the industry. As an example of the prominence of 3GPP and its place in the wireless standards industry, I note that textbooks directed readers to the 3GPP website for information about relevant standards. For example, **Appendix 6** at 6, 9 (“The latest specifications can be obtained from 3GPP [9]”, “[9] <http://www.3GPP.org>”); **Appendix 8** at 10 (“3GPP TSs and TRs are publicly available at the 3GPP web site at either of the

following URIs: <http://www.3gpp.org/specs/specs.htm> [or] <http://www.3gpp.org/ftp/Specs/archive/>). Because the purpose of 3GPP is the worldwide adoption of a common standard, no restrictions on distribution or discussion have ever been placed on 3GPP documents. **Appendix 10** at 8 (“No password is needed to access any information on the 3GPP Web site, all information is openly published”).

C. 3GPP Structure and Standards Development Process

26. Within 3GPP, responsibility for producing specifications was delegated to the Technical Specification Groups (TSGs). **Appendix 5** at 10, 13 (3GPP Working Procedures, “TSG tasks”). At its inception, 3GPP was divided into four Technical Specification Groups (TSGs), each covering a particular category of technology. **Appendix 2** at 31 (3GPP Partnership Project Description); **Appendix 6** at 5, 6 (textbook listing four TSGs and noting the subsequent addition of a fifth TSG); **Appendix 4** at 6, 11, 12. Each TSG is further divided into a number of Working Groups (WGs). **Appendix 8** at 8, 9; **Appendix 4** at 6; *see also* **Appendix 5** at 13 (3GPP Working Procedures). Two of the TSGs from 1999 are still in existence in 2024: TSG Radio Access Networks (RAN) and TSG Service & Systems Aspects (SA). The activities of two other TSGs, TSG Core Networks (CN) and TSG Terminals (T), were amalgamated under Core Network and Terminals (CT)

following the closure of TSG T in 2005, with responsibility for terminal test specifications being moved to a RAN working group (RAN WG5). The fifth TSG, GSM EDGE Radio Access Networks (GERAN), was responsible for evolution of the GSM radio technology from 2000 until that TSG closed in 2016 and its work was transferred to a RAN working group (RAN WG6) which was itself closed in July 2020.

27. The TSGs held quarterly plenary meetings where members' contributions, draft specifications/reports, and other documents that had been agreed upon by the Working Groups were presented for discussion and approval. **Appendix 5** at 23 (3GPP Working Procedures, "Deliverable types," stating that Technical Specifications and Technical Reports are "drawn up by the TSGs" and are approved by TSGs); **Appendix 8** at 9 ("3GPP Deliverables"). Once a Technical Specification was, or Change Requests creating a new version of a Technical Specification were, formally approved by TSG plenary, the latest version of said Technical Specification would be created by the Mobile Competence Centre (MCC) and uploaded to the file server. **Appendix 10** at 6, 7; **Appendix 11** at 1. In that way, the conclusion of 3GPP TSG plenary meetings serves as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting will shortly be made available on the public 3GPP server.

28. As part of the standards development process, delegates could submit contributions on behalf of the Individual Members. Members had an incentive to stay updated on 3GPP developments because those members usually wanted to contribute to the standard and make suggestions as to what technology and/or features should (or should not) be included. Delegates also attended 3GPP meetings to keep their employers abreast of developments related to the standards that would ultimately apply to those members and the products those members (*e.g.*, companies) produced. 3GPP members around the world, and the interested POSITAs employed by them, would have been motivated to stay up to date regarding 3GPP technology evolution to ensure their research and development programmes remained relevant to the systems being specified and that their products were compliant with the published 3GPP specifications. In light of this need to follow the standards development process, delegates often distributed 3GPP-related documents far beyond the attendees at 3GPP meetings. This was certainly my experience at Samsung.

D. 3GPP Documents

1. Technical Specifications and Reports

29. The Technical Specifications and Reports developed by 3GPP were, and still are, driven by the technical contributions of 3GPP members. As part of that

development process, various types of documents were produced. The 3GPP process involved the consideration of temporary documents (“TDocs,” also referred to as “contributions”), many of which constituted technical proposals for how the system should be implemented and some of which were adopted as the basis for parts of the Technical Specifications.

30. As I noted in paragraphs 20 and 22, a primary purpose of 3GPP is to prepare, approve, and maintain globally applicable Technical Specifications and Technical Reports. **Appendix 5** at 7 (3GPP Working Procedures, “Purpose”). A “Technical Specification” as defined by 3GPP is “[a] 3GPP output document containing normative provisions approved by a Technical Specification Group.” **Appendix 5** at 28. 3GPP would (and still does) periodically freeze a complete set of standards (referred to as a “Release”), and each set would include new specifications. **Appendix 10** at 6. 3GPP would also make publicly available draft specifications that would usually be included as part of the next Release once approved.

31. It was widely known that Technical Specifications (and Technical Reports) were publicly available on 3GPP’s website. It was also well known that the latest version of a given specification that was under change control would be made available following each TSG Plenary meeting responsible for that specification, and that TSG Plenary meetings usually occur four times per year. **Appendix 10** at 6, 7;

Appendix 11 at 1.

32. Latest and previous versions of Technical Specifications could be easily accessed from the 3GPP website. The specifications page provided direct links to the specifications area in the 3GPP website's file repository. **Appendix 11** at 1. In 2016, the specifications page listed the specifications by the date of the approval of the latest versions reflecting the TSG plenary meeting date. *E.g.*, **Appendix 11** at 1.

33. Additionally, the 3GPP specifications followed a clear numbering scheme to help the public, including interested POSITAs, identify the subject matter of each specification. **Appendix 12** at 1. As described on the 3GPP Numbering Scheme webpage, all 3G and GSM specifications had a specification number of 4 or 5 digits, where the first two digits defined the series. **Appendix 12** at 1. The Numbering Scheme webpage included a table showing the subject matter corresponding to each series. **Appendix 12** at 1. For example, the "38 series" focused on "Radio Technology beyond LTE". **Appendix 12** at 1. An interested POSITA could narrow down the relevant specifications based on whether the specification applied to e.g. 5G NR, evolved UTRA (*i.e.*, 4G or LTE), 3G, GSM, (GSM-only specifications were transferred from ETSI to 3GPP in July 2000), or to more than one system. **Appendix 12** at 1. For example, for a specification in the 21–

35 series, this could be determined based on the third digit of the specification number, where a “0” indicates that the specification applies to GSM as well as to 3G systems. Specifications outside the 21–38 series in 2016 applied only to GSM systems. **Appendix 12** at 1.

34. The specifications were stored on the 3GPP website’s file repository as zipped files, where the filenames followed the structure: SM[-P[-Q]]-V.zip. This format corresponded to the numbering scheme discussed in paragraph 33. **Appendix 12** at 2. “S” represented the series number; “M” represented the mantissa (the part after the series number); “P” represented an optional part number; “Q” represented an optional sub-part number; and “V” represented the version number (without the separating dots). **Appendix 12** at 2.

35. The Working Groups would create incremental versions of the draft specifications (*e.g.*, V0.2.1, V1.0.0, V1.1.0, etc.). These versions were made available on the 3GPP website’s file repository which is accessible from the 3GPP specifications page. The version numbering scheme for Technical Specifications and Technical Reports was standardized by 3GPP. The version number included three fields: the major version field, the technical version field, and the editorial version field. **Appendix 13** at 3. The major version field reflects the stage of the specification, with “0” representing an immature draft and a value of “3” or greater

representing a specification that has been approved by the relevant TSG and thus placed under change control. **Appendix 13** at 3. The technical version field begins at zero and is incremented every time a technical change is made to the specification (either as part of the drafting process or as part of an approved change request). **Appendix 13** at 3. The editorial version field begins at zero and is incremented each time a non-technical change is made to the specification (*e.g.*, to fix a typographical or formatting issue). **Appendix 13** at 3.

36. I understand that the alleged invention in the US 11,540,272 patent relates to cellular telecommunications networks, and more particularly to allocating data channel resources in wireless access networks. Any POSITA interested in such functionality would have been monitoring 3GPP's activities in this area and would probably have been already participating as a full or associate member or observer in the standard development process, or would have at least known that information regarding the proposed revisions to the technical specifications under discussion were available through 3GPP.

2. 3GPP TDocs

37. As mentioned in paragraph 29, the technical specifications and reports developed by 3GPP were and are driven by the technical contributions of 3GPP member companies. As part of that development process, various types of

documents were produced and submitted. Relevant to this case, the 3GPP process involved the consideration of temporary documents or “TDocs,” which are also referred to as proposals, contributions, or change requests. The agreement of proposals submitted as TDocs results in the production of technical specifications.

38. Prior to each Working Group meeting, members of the Working Group would prepare TDocs to identify, discuss, and/or propose a new feature or change(s) to an existing feature or to identify a technical issue for discussion. Interested POSITAs would have known that TDocs could be a helpful source of technical information regarding the 3GPP specifications.

39. Each TDoc was assigned a TDoc number, according to a standard format set by 3GPP.¹ As described in the 3GPP Working Procedures, the numbering system followed the format xminnnzzzz. **Appendix 5** at 19. This general naming convention has been in use since at least 1999 with only minor variations. Within that format, “x” referred to the relevant TSG. **Appendix 5** at 20. For example, “R” was used for TSG RAN. **Appendix 5** at 20. Likewise, “m” referred to the relevant Working Group. **Appendix 5** at 20. A document for RAN WG1 would therefore begin with “R1.” **Appendix 5** at 20. The “i” is normally a hyphen character but may

¹ Documents other than technical contributions (such as meeting reports) were also assigned TDoc numbers for ease of reference.

take on other values depending on the meeting to which the Tdoc is submitted. The two digits “nn” represented the year (*e.g.*, 18), and the digits “zzzz” represented the unique document number. **Appendix 5** at 20. This document number was used as the TDoc’s filename. **Appendix 5** at 20.

40. Each TDoc would include in its header the meeting at which the contributor intended the TDoc to be discussed. Most TDocs were uploaded to the 3GPP website for public viewing prior to the relevant Working Group meeting listed on the TDoc, although some TDocs, including those created at meetings, were uploaded during or after the meeting. **Appendix 10** at 8. The documents were uploaded to the public file repository in an area allocated to the particular Working Group, *e.g.*, **Appendix 14** at 2 (RAN WG1 homepage with link to WG1’s “Documents area”). Immediately upon upload, any member of the public could download and access the TDocs and other documents offered for discussion. This process has been in place since I began attending Working Group meetings in 1999. In 2016, a live list of TDocs, automatically updated as they were allocated, was usually available prior to the working group meeting once the TDoc number allocation was open. This could be accessed by following the “Next meeting information & previous meeting reports and documents” link on the working group home page, and the “Full documents list” link for the meeting in question. **Appendix**

14, Appendix 15 at 1, Appendix 16.

E. The 3GPP Website's Public File Repository

41. All TDocs, Technical Reports, and Technical Specifications were also freely available to interested members of the public through the public file repository accessible via the 3GPP website. Interested members of the public would have been well aware of 3GPP and of the 3GPP website. 3GPP documents were accessible to any member of the public through the 3GPP website without providing any login credentials or other exclusive access criteria. **Appendix 10** at 8.

42. In 2016, any interested member of the public could locate relevant documents of interest on the 3GPP website using reasonable diligence based on the website's indexing scheme or the TDoc's naming convention. The documents on the 3GPP website were (and remain) organized according to the relevant Working Groups within 3GPP (each of which focused on particular subject matter) and then further organized based on the meetings of those groups. The Technical Specifications and Reports were (and remain) organized according to their subject matter as indicated by their series number and version. POSITAs would have known which Working Groups focused on particular subject matter.

43. An interested member of the public could locate documents of interest by first navigating a web browser to the 3GPP website (www.3gpp.org). In the 2016

timeframe, to locate documents from the 3GPP home page, a user could have clicked “Specification Groups” **Appendix 17**. The corresponding webpages contained links to the 3GPP’s public file repository (*e.g.*, through the “Documents area” link of a Working Group page). **Appendix 14**. To locate specifications, a user could have clicked “Specifications” and followed links as described in section III.D.1 above. Instead of accessing the 3GPP file repository from the 3GPP website home page, a user could have also accessed the file repository through the web address www.3gpp.org/ftp or directly using ftp client software connected to [ftp.3gpp.org](ftp://ftp.3gpp.org). A POSITA was also able to search for relevant documents using keywords on the search facility on the 3GPP website from at least 2000, and from at least 2015 using the 3GPP search portal (<https://portal.3gpp.org/#/>), where an interested person could search for documents by title and source, among other things.

44. The top two levels of indexing within the file repository were based wholly on subject matter, as reflected by the division of subject matter among the various TSGs and Working Groups, or into various Specifications. Specifically, an individual could select the relevant Specification Series (‘Specs’) or Specification Group (TSG) covering the subject matter of interest. **Appendix 18**.

45. For example, if the individual were interested in the radio access aspects of 3GPP, they would click “tsg_ran.” From there, the individual would click

on the particular RAN Working Group covering the subject matter of interest.

Appendix 19.

46. Then, if the individual were interested in the Radio Interface Radio layer 1, the individual would know to choose the folder for WG1. **Appendix 19.** Once a user is in the relevant Working Group folder (RAN WG1 in this example), an individual would see a list of all meetings held by RAN WG1 including ad hoc meetings. **Appendix 20.** As shown in **Appendix 20**, a folder existed for each meeting. For example, “R1_86b” corresponded to TSG RAN WG1 #86bis held in October 2016.

47. A POSITA would know which meeting(s) would have covered particular subject matter based on the working groups area of responsibility (*e.g.*, for RAN WG1 - **Appendix 14**), and from publicly available meeting agendas. **Appendix 21** (Agenda link). Many POSITAs received notification of the meeting agenda directly via the 3GPP Working Group email reflector lists. **Appendix 22.** Further, an individual could ascertain what subject matter was addressed at each meeting by reviewing the report issued after each meeting, stored in the Report directory and also sometimes sent as a draft meeting report linked in (or attached to) an email sent via the group’s email reflector. **Appendix 23; Appendix 24.** The final meeting report also contained a complete list of TDocs submitted to the meeting

which could be sorted by title, agenda item and agenda item description among other things. **Appendix 25** (Annex B of the meeting report). This TDoc list was usually made available before, during, and after the meeting as TDocs were treated and numbers allocated for new ones. See e.g., **Appendix 26**. A list of the participants at the meeting was also provided **Appendix 31** (Annex A of the meeting report).

48. In my experience, whilst the servers used for 3GPP file repository and many of its directories have been updated since 1999, and directories may as a result have later dates associated with them (*e.g.*, reflecting the last time they were modified in some way or their contents were updated), the original upload date for files including specifications has always been preserved, providing a true and accurate indication of their earliest availability for download.

49. Once an individual navigated to the desired meeting folder, for example “TSGR1_86b)” the individual could then select the “Docs” folder to view the documents associated with that meeting. **Appendix 21, Appendix 27**. The documents within this folder were listed by TDoc number, and interested members of the public would have known to review the meeting report for each meeting to confirm which topics were discussed at that meeting. *E.g.*, **Appendix 23, Appendix 25**.

50. Many TDocs were uploaded to the public file server for public viewing

prior to the relevant meeting (although some TDocs, particularly those created during meetings, were uploaded during or soon after the meetings). **Appendix 10** at 8. Throughout and since my participation in 3GPP, it has been recommended that delegates attending a meeting download the relevant set of documents from the 3GPP file repository onto their personal computers prior to each meeting. **Appendix 10** at 7. Given that any interested member of the public could and was likely to subscribe to the Working Group email reflector (see section IV), it would also have been simple to locate the location of relevant TDocs on the 3GPP server based on the information sent out to said email reflector.

51. 3GPP's public file repository provides a reliable mechanism for identifying the date and time a document was uploaded to the website and then available to download for public viewing. When a document is uploaded, the file server automatically assigns the document a time stamp—*i.e.*, an accurate and automatically computer-generated electronic record of when the document was uploaded—as part of the regular business practices of 3GPP. **Appendix 10** at 8 (3GPP FAQs). This has been the practice regarding uploading documents to the 3GPP file repository since 3GPP was inaugurated, and my personal experience confirms that the time stamps have always been a reliable way to determine when a file was uploaded to the 3GPP website and immediately available for public

download.

52. In 2016, following each 3GPP meeting, meeting secretaries would often distribute the meeting minutes via the corresponding email list with a request for comments. **Appendix 23, Appendix 24.** Such emails would effectively inform subscribers that the meeting had taken place, would inform subscribers of the subject and documents that had been treated (or not), and in the event that the meeting was a TSG plenary meeting, serve as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting, would shortly be made available on the 3GPP public server. Further, an interested member of the public following a certain topic would have known to check a meeting report for related contributions.

F. The 3GPP Listservs

53. An important means to facilitate discussions, and for distributing draft specifications and other information to 3GPP members and interested members of the public was through the 3GPP email listservs (also referred to as the “email exploder” or “email reflector”). All TSGs and Working Groups, including TSG RAN and RAN WG1, have listservs corresponding to their groups. Each listserv acts as an email alias that distributes emails and email attachments sent to that alias to every person subscribed to that listserv.

54. Subscribing to a listserv was simple and was open to any member of the public—not just 3GPP members. **Appendix 28.** The email listservs were featured prominently on 3GPP’s Specification Groups page and could be accessed via the “Email Lists” link. **Appendix 17.** That link would take a user to a page providing instructions to subscribe to and access the list of ETSI email listservs including those for 3GPP. **Appendix 28.** It is my opinion that the 3GPP email listservs were well known among persons interested in following or participating in the development of wireless cellular standards. **Appendix 4** at 7 (“[g]iven that 3GPP has participants from all over the world, the use of the Internet, email exploders [i.e., listservs] and other such facilities have proved invaluable for distributing and sharing information, working drafts and so on”); **Appendix 29**, Section 5 (“The vast majority of the technical discussions and decision making in both IETF and 3GPP is done over mailing lists. ... It is recommended that interested individuals subscribe to and participate in these lists.”).

55. There were hundreds of subscribers (and often over a thousand) to the RAN WG1 listserv. **Appendix 30** at 2. The people that subscribed were typically engineers, such as me, but also technology strategists and technical managers. The subscriber list typically included at least all those persons who planned to attend an upcoming meeting where a TDoc may be discussed. The typical practice among

people who were to attend an upcoming meeting was to use the WG's listserv to review and discuss opinions about the ideas conveyed in TDocs. The email listserv for RAN WG1 provided an efficient way for contributors to quickly and efficiently disseminate their views. The number of subscribers for a particular WG listserv usually far exceeded the number of people attending those WG meetings. For example, 337 delegates attended RAN WG1 Meeting #86b, whereas the RAN WG1 email list had over 1000 subscribers between 2012 and 2021. See, e.g., **Appendix 31, Appendix 32** at 2, **Appendix 30** at 2.

56. No confidentiality limitations or restrictions on further dissemination were placed on documents distributed via the listservs. **Appendix 10** at 9 (“This distribution on the group’s email exploder is important, because once that happens, the document is effectively in the public domain, since membership of the exploder is open to all and is (almost) unpoliced.”) (emphasis added). This has been the practice and understanding since I became involved with 3GPP in 1998-1999. As I point out in paragraph 47, the listservs were also used to distribute information about upcoming TSG or WG meetings, such as invitations, draft agenda and draft reports for each meeting. E.g., **Appendix 33, Appendix 22, Appendix 24**.

57. The listserv emails were (and remain) archived in a public online archive (available at <http://list.etsi.org/scripts/wa.exe?INDEX>). This archive has

existed and been accessible to POSITAs since the email lists were created in 1998.

Appendix 33. Each archived email contains a computer-generated date stamp indicating when the email was sent and thereby when any attached document became publicly disclosed through distribution to listserv subscribers. The listserv archives are text searchable, and include advanced searching features. For example, and without limitation, the archives can be searched using keywords, quoted phrases, and terms and connectors (e.g., “and,” “or,” and “and not”). The archives have been text searchable since at least 2002.

IV. 3GPP EXHIBITS

A. Ex. 1010: 3GPP TS 36.213 V13.1.0 (2016-03) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)

58. 3GPP TS 36.213 v13.1.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)”.

59. The date on the face of the specification (“2016-03”) corresponds to the year (2016) and month (March) that this version of the specification was approved by 3GPP TSG RAN and subsequently made publicly available.

60. 3GPP TS 36.213 v13.1.0 being an approved version of the Release 13

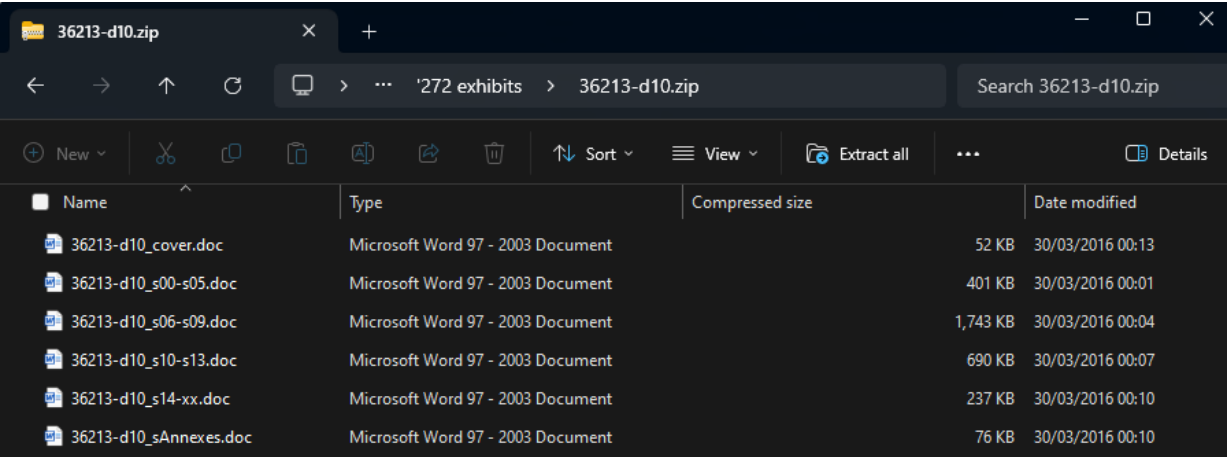
specification on multiplexing and channel coding was approved by TSG RAN #71 held March 7 – 10, 2016. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31. The approval of the TS 36.213 v13.1.0 is confirmed by the approval of the Change Requests to TS 36.213 v13.0.1 documented in the meeting report from TSG RAN #71. **Appendix 34** at 110, 151, 152, **Appendix 34a** at indices 376, 378, 379, 381 – 425.

61. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.213 v13.1.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.213” in the specification number search bar, and for the TS 36.213 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.213 found

at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.213. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 35** at 3.

	36213-d01.zip	2016/01/26 17:05	2956,8 KB
	36213-d10.zip	2016/03/29 21:25	3197,1 KB
	36213-d11.zip	2016/03/31 14:18	3197,4 KB

62. The archive directory index stated that TS 36.213 v13.1.0 was uploaded on “2016/03/29”. Selecting the link for “36.213-d10”, I downloaded a zip file of the same name. The zip file contained six Microsoft Word documents with the filenames starting “36213-d10” and having date stamps of “30/03/2016” (European date format)². An excerpt of the zip file directory is provided below.



Name	Type	Compressed size	Date modified
36213-d10_cover.doc	Microsoft Word 97 - 2003 Document	52 KB	30/03/2016 00:13
36213-d10_s00-s05.doc	Microsoft Word 97 - 2003 Document	401 KB	30/03/2016 00:01
36213-d10_s06-s09.doc	Microsoft Word 97 - 2003 Document	1,743 KB	30/03/2016 00:04
36213-d10_s10-s13.doc	Microsoft Word 97 - 2003 Document	690 KB	30/03/2016 00:07
36213-d10_s14-xx.doc	Microsoft Word 97 - 2003 Document	237 KB	30/03/2016 00:10
36213-d10_sAnnexes.doc	Microsoft Word 97 - 2003 Document	76 KB	30/03/2016 00:10

² The doc files have a later date than the zip file, due to the time-zone where they were last modified being ahead of the time-zone of 36.213 directory listing.

63. I have confirmed that the six Word documents with filenames starting “36213-d10” together constitute TS 36.213 v13.1.0. A true and correct copy of the six Microsoft Word documents with filenames starting “36213-d10” is the TS 36.213 v13.1.0 that is provided in Ex. 1010.

64. Based on my experience, I understand these date stamps to mean that 36213-d10.zip was uploaded to 3GPP’s publicly available website on March 29, 2016, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on March 29, 2016 and thereafter.

B. Ex. 1011: 3GPP TS 36.212 V13.1.0 (2016-03) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)

65. 3GPP TS 36.212 v13.1.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)”.

66. The date on the face of the specification (“2016-03”) corresponds to the year (2016) and month (March) that this version of the specification was approved by 3GPP TSG RAN and subsequently made publicly available.

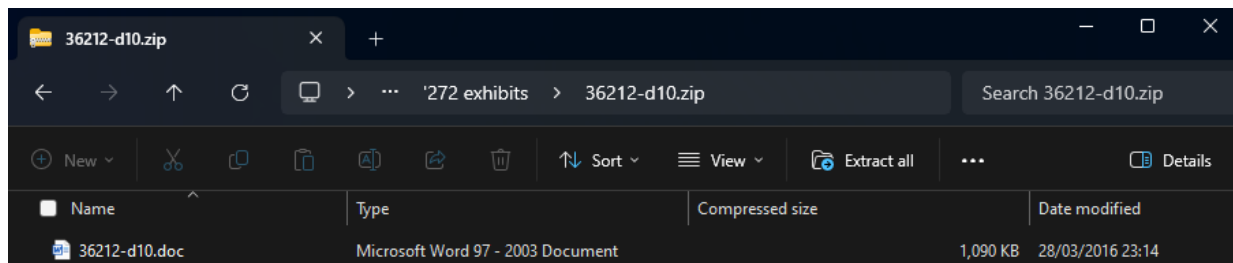
67. 3GPP TS 36.212 v13.1.0 being an approved version of the Release 13 specification on multiplexing and channel coding was approved by TSG RAN #71 held March 7 – 10, 2016. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31. The approval of the TS 36.212 v13.1.0 is confirmed by the approval of the Change Requests to TS 36.212 v13.0.0 documented in the meeting report from TSG RAN #71. **Appendix 34** at 149, **Appendix 34a** at indices 365, 367 – 371, 374.

68. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.212 v13.1.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.212” in the specification number search bar, and for the TS 36.212 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this

specification,” which took me to the archive housing all versions of TS 36.212 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.212. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 36** at 2.

	36212-d10.zip	2016/03/29 21:22	1090 KB
	36212-d20.zip	2016/06/30 12:53	1193 KB
	36212-d30.zip	2016/09/29 9:50	1197,6 KB

69. The archive directory index stated that TS 36.212 v13.1.0 was uploaded on “2016/03/29”. Selecting the link for “36.212-d10”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document with the filename “36212-d10.doc” and having date a stamp of “28/03/2016” (European date format). An excerpt of the zip file directory is provided below.



70. I have confirmed that the Word document “36212-d10.doc” is TS 36.212 v13.1.0. A true and correct copy of the Microsoft Word document with filename “36212-d10.doc” is the TS 36.212 v13.1.0 that is provided in Ex. 1011.

71. Based on my experience, I understand these date stamps to mean that 36212-d10.zip was uploaded to 3GPP's publicly available website on March 29, 2016, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on March 29, 2016 and thereafter.

C. EX-1020: R1-1610129 “Summary of 86-19 time domain structure use case”

72. R1-1610129 is a TDoc submitted to the 3GPP TSG RAN WG1 #86bis meeting which was held between October 10 – 14, 2016. It follows the general naming format (“xminnnzzzz”) described in paragraph 39³. Accordingly, “R1” indicates that the contribution was submitted to RAN WG1, “16” indicates the year (2016) that this technical contribution was submitted, and “10129” is the unique number that was assigned to this contribution document. It is titled “Summary of 86-19 time domain structure use case”.

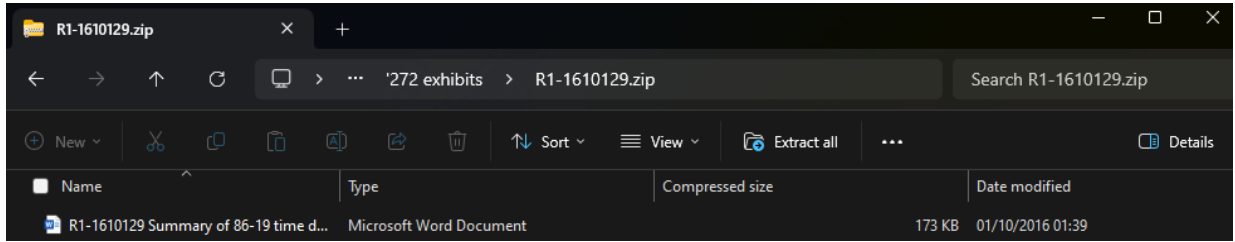
73. As I mention in paragraph 41 above, it has always been, and was in 2016, standard practice to make 3GPP meeting documents publicly available on the 3GPP public file server from where an interested member of the public exercising

³ From RAN1 #86bis, RAN1 added another digit to the unique identifier “z” field to cater for the increasing number of Tdocs being submitted.

reasonable diligence could freely access them. To confirm the availability of R1-1610129 on the 3GPP document server in 2016, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN1 – Radio Layer 1” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN Working Group 1 are stored, and from where I navigated to the documents for RAN WG1 #86bis. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 27** at 10.

 R1-1610128.zip	2016/10/18 20:55	172,9 KB
 R1-1610129.zip	2016/10/01 7:40	173,1 KB
 R1-1610130.zip	2016/10/01 6:22	1122,5 KB

74. The Docs directory index stated that R1-1610129 was uploaded on “2016/10/01. I selected the link for “R1-1610129.zip” and downloaded a ZIP file of the same name. The ZIP file contained a Microsoft Word document, “R1-1610129 Summary of 86-19 time domain structure use case.doc”, having a date stamp of “01/10/2016” (European date format) the day that the ZIP file was uploaded.



75. A true and correct copy of the document within the ZIP file (R1-1610129.doc) is provided as Ex. 1020. Based on my experience, I understand that these date stamps mean that R1-1610129.zip was uploaded to 3GPP’s publicly available website on October 1, 2016, prior to the RAN WG1 #86bis meeting, and that any member of the public could have downloaded the ZIP file, extracted the document enclosed, and viewed the contents of said document without restriction on October 1, 2016 and thereafter. The draft report from RAN WG1 #86bis, confirms the availability and discussionn of R1-1610129 at the meeting (**Appendix 23** at 81), as does the Tdoc list, **Appendix 37a** at index 1570. I have no reason to believe that either the date stamp or the report from RAN WG1 #86bis is inaccurate. I have therefore determined that R1-1610129 was publicly available on the file server no later than October 1, 2016.

76. Based on the information above, it is my opinion that R1-1610129, titled “Summary of 86-19 time domain structure use case” and provided as Ex-1020, was publicly available to download from the 3GPP file server no later than October 1, 2016 and could have been distributed thereafter without restriction. Further, it was

publicly available at the 3GPP TSG RAN WG1 #86bis meeting held October 10 – 14, 2016.

D. Ex. 1021: Draft_Minutes_report_RAN1#86b_v010

77. The draft minutes of RAN WG1 #86bis meeting were distributed by the RAN WG1 secretary via the RAN WG1 listserv on October 20, 2016. **Appendix 24.** Note that such “distribution on the group’s email exploder is important, because once that happens, the document is effectively in the public domain, since membership of the exploder is open to all and is unpoliced”. **Appendix 10** at 8. Further, the draft minutes of RAN WG1 #86bis were available to download from the RAN WG1 #86b report directory on the same date of October 20, 2016. **Appendix 37.** I have no reason to believe that the date stamp on either of the email or file server is innacurate. I have therefore determined that the draft minutes from RAN1 #86bis were publicly available on the file server no later than October 1, 2016.

V. CONCLUSION

78. In conclusion, my opinions are as follows:

- a. 3GPP TS 36.213 v13.1.0 provided as Ex. 1010, was publicly available to download from the 3GPP file server from March 29, 2016.
- b. 3GPP TS 36.212 v13.1.0 provided as Ex. 1011, was publicly available to download from the 3GPP file server from March 29, 2016.

- c. 3GPP R1-1610129 provided as Ex. 1020, was publicly available to download from the 3GPP file server from October 1, 2016.
- d. Draft report from 3GPP TSG RAN WG1 #86bis provided as Ex. 1021, was publicly available to download from the 3GPP file server from October 20, 2016.

79. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful 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.

November 16, 2024

A handwritten signature in black ink, appearing to be 'CB', is written over a solid horizontal line.

Printed Name: Craig Bishop