IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ASUS TECHNOLOGY LICENSING INC. AND CELERITY IP, LLC, **Plaintiffs,** **vs.** **AT&T CORP., AT&T MOBILITY LLC, AT&T MOBILITY II LLC, AT&T SERVICES INC., T-MOBILE USA, INC., AND CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,** **Defendants.**	**Civil Action No. 2:23-cv-00486** **(Lead Case)** **Civil Action No. 2:23-cv-00487** **(Member Case)** **Civil Action No. 2:23-cv-00488** **(Member Case)** **JURY TRIAL DEMANDED**
AT&T CORP., AT&T MOBILITY LLC, AT&T MOBILITY II LLC, AT&T SERVICES INC., T-MOBILE USA, INC., AND CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, **Counterclaim Plaintiffs,** **vs.** **ASUSTEK COMPUTER INC., ASUS TECHNOLOGY LICENSING INC., AND CELERITY IP, LLC,** **Counterclaim Defendants.**	

DEFENDANTS' P.R. 3-3 INVALIDITY CONTENTIONS

Pursuant to P.R. 3-3, P.R. 3-4, and the Docket Control Order in the above-captioned cases (No. 23-cv-486, Dkt. 52), Defendants-Counterclaim Plaintiffs AT&T Corp., AT&T Mobility LLC, AT&T Mobility II LLC, AT&T Services Inc., T-Mobile USA, Inc., and Cellco Partnership d/b/a Verizon Wireless (collectively, the "Carriers") serve their Preliminary Invalidity Contentions with respect to the claims identified by Plaintiffs-Counterclaim Defendants ASUS Technology Licensing Inc. ("ATL") and Celerity IP, LLC ("Celerity") in their

Disclosure of Asserted Claims and Infringement Contentions dated January 4, 2024 ("Infringement Contentions").

I. Preliminary Statement and Reservation of Rights

A. The Asserted Claims

According to the Infringement Contentions, Plaintiffs assert the following patents, claims, and priority dates in their Infringement Contentions.

Asserted Patent	Asserted Claims	Asserted Priority Date
10,951,359 (the "'359 Patent")	1-4, 6-9, 11-14, 16-19, 21-23	January 18, 2018
10,148,402 (the "'402 Patent")	1-4, 12-15	January 6, 2017
10,887,868 (the "'868 Patent")	5, 6, 8, 13-14, 16, 18	July 22, 2016
10,798,754 (the "'754 Patent")	1-10	July 24, 2017

The patents identified in the foregoing table are collectively referred to as the "Asserted Patents," and the claims identified in the foregoing table are collectively referred to as the "Asserted Claims." Any reference to an "asserted priority date" in these Preliminary Invalidity Contentions refers to the "Asserted Priority Date" identified in the foregoing table, and further defined in section I.B, *infra*.

The Carriers contend that each of the Asserted Claims is invalid under at least one or more of 35 U.S.C. §§ 101, 102, 103, or 112. Pursuant to the Local Patent Rules, the Carriers do not provide any contentions regarding any claims not asserted by Plaintiffs. To the extent the Court permits Plaintiffs to assert additional claims in the future, the Carriers reserve all rights to amend or supplement these Preliminary Invalidity Contentions or to otherwise disclose new or supplemental invalidity contentions regarding such claims. Furthermore, because discovery is ongoing,[1] the Carriers reserve the right to revise, amend, and/or supplement the information

[1] The Carriers' ongoing efforts include but are not limited to: serving subpoenas on prior artists and inventors regarding prior art, seeking additional information related to the references and systems disclosed in these Preliminary Invalidity Contentions, and seeking additional

provided herein, including by identifying, charting, and relying on additional references, should discovery yield additional information or references.

The Carriers further reserve the right to amend these Contentions in response to any claim construction rulings, as permitted by the Local Patent Rules and/or with permission of the Court.

The Infringement Contentions are deficient in multiple respects and do not provide the Carriers with sufficient information to understand the specific accused features and components and the alleged factual and evidentiary bases for Plaintiffs' infringement allegations. Among other things, the Infringement Contentions lack the specificity required by P.R. 3-1, fail to properly identify accused instrumentalities, and fail to adequately explain Plaintiffs' infringement theories for numerous limitations. Plaintiffs have prejudiced the Carriers' ability to understand, for purposes of preparing these Preliminary Invalidity Contentions, what Plaintiffs allege to be the scope of the Asserted Claims. If Plaintiffs modify any assertion or contention in their Infringement Contentions, or present any new assertion or contention relevant to these Preliminary Invalidity Contentions to the extent allowed by the Local Patent Rules and/or the Court, the Carriers reserve the right to supplement or otherwise amend these Preliminary Invalidity Contentions.

B. Priority Date Of The Asserted Patents

Plaintiffs' Infringement Contentions contain allegations regarding the priority date to which Plaintiffs allege they are entitled for each of the Asserted Claims. The Carriers do not

information related to available prior art systems, as well as Plaintiffs' Infringement Contentions and the products accused of infringing therein. No depositions have been taken as of this time, including, without limitation, depositions of any inventors, authors, or entities listed on any references or systems identified in these Preliminary Invalidity Contentions. Further, the Carriers reserve the right to review and supplement these Preliminary Invalidity Contentions with respect to any additional prior art that becomes apparent as discovery proceeds.

agree that Plaintiffs are entitled to the Asserted Priority Dates for each of the Asserted Claims, as Plaintiffs have failed to prove they are entitled to the Asserted Priority Dates.

Any reference to an "asserted priority date" in these Preliminary Invalidity Contentions refers to the priority dates identified in Plaintiffs' Infringement Contentions. Reference to a "priority date" or an "asserted priority date" should not be construed to mean that the Carriers agree that any of the Asserted Patents or Claims are in fact entitled to such priority date, or that Plaintiffs have provided proper notice as to their contentions for a priority date.[2] To the extent Plaintiffs allege that any prior art relied on in these Preliminary Invalidity Contentions does not actually qualify as prior art to an Asserted Patent, the Carriers reserve the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for a particular Asserted Patent and/or Asserted Claim).[3] Likewise, to the extent Plaintiffs successfully establish an invention date before any of the prior-art references relied on by the Carriers, then those references serve as evidence of obviousness, particularly, and/or contemporaneous invention by others.

C. Claim Construction

The Carriers' Preliminary Invalidity Contentions are based on (1) the Carriers' present understanding of the Asserted Claims, (2) the claim construction Plaintiffs appear to be proposing based on the Infringement Contentions, all without regard to whether the Carriers agree with Plaintiffs' apparent or expressed claim constructions. The Carriers reserve the right to supplement or otherwise amend these Preliminary Invalidity Contentions in response to any

[2] The Carriers reserve the right to rely on additional documents and evidence, including without limitation the documents cited in Plaintiffs' Infringement Contentions, in the event that Plaintiffs fail to establish that any Asserted Claim of any Asserted Patent is entitled to the Asserted Priority Date.

[3] The Carriers reserve the right to rely on additional documents and evidence to rebut any efforts by Plaintiffs to allege any reference was not publicly available or otherwise available as prior art.

proposed claim constructions or alleged supporting evidence offered by Plaintiffs, any report from any expert witness for Plaintiffs regarding claim construction issues, any claim construction briefing filed by Plaintiffs, and any position taken by Plaintiffs concerning claim construction, infringement, or invalidity.

The Carriers take no position on any matter of claim construction in these Preliminary Invalidity Contentions. If the Carriers' apparent claim constructions herein are consistent with any explicit, apparent, or implied claim constructions in the Infringement Contentions, no inference is intended and no inference should be drawn that the Carriers agree with any of Plaintiffs' claim constructions. Any statement herein describing or tending to describe any claim element is provided solely for the purpose of understanding and/or applying the cited prior art. The Carriers expressly reserve the right to (1) propose any claim construction the Carriers consider appropriate, (2) contest any claim construction proposed by Plaintiffs that the Carriers consider inappropriate and/or inaccurate, and/or (3) take positions with respect to claim construction issues that are inconsistent with, or even contradictory to, claim construction positions expressed or implied in these Preliminary Invalidity Contentions.

Prior art not included in these Preliminary Invalidity Contentions, whether now known to the Carriers or not, might become relevant depending on the claim constructions proposed by the Carriers and/or the Court's claim construction rulings. The Carriers reserve all rights to supplement or modify the positions and information in these Preliminary Invalidity Contentions, including without limitation the prior art and grounds of invalidity set forth herein, pursuant to P.R. 3-6 after the Court has construed the Asserted Claims.

D. Ongoing Discovery and Supplementation

The Carriers' investigation, including of prior art and grounds for invalidity, is ongoing. Furthermore, the Carriers' invalidity positions will be the subject of expert testimony. The

Carriers base these Preliminary Invalidity Contentions on their current knowledge and understanding of the Asserted Claims, Plaintiffs' Infringement Contentions, and the prior art, systems, and other facts and information available as of the date of these contentions.

The Carriers reserve the right to supplement these Preliminary Invalidity Contentions, including, without limitation, by adding additional prior art and grounds of invalidity in accordance with the Federal Rules of Civil Procedure, the Local Rules, the Local Patent Rules, the Docket Control Order, Court order, or otherwise.

E. Prior Art Identification and Citations Thereto

In these Preliminary Invalidity Contentions, the Carriers identify specific portions of prior art references that disclose the elements of the Asserted Claims. While the Carriers have identified exemplary prior art references for each element, they do not necessarily identify every disclosure of the same element in each prior art reference. A person of ordinary skill in the art would read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field and would rely upon other information, including other publications and general scientific or engineering knowledge. The Carriers therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and prior art products and expert testimony to provide context and to aid understanding and interpretation of the identified portions of the prior art.

The Carriers also reserve the right to rely upon (1) other portions of the cited prior art references, other publications, prior art products, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including on the basis of modifying or combining certain cited references; (2) all versions of a cited prior art publication (*e.g.*, citations to 3GPP technical specifications and/or reports include all versions of such technical specifications and/or reports that qualify as prior art, citations to an issued

patent include the published patent application); (3) admissions relating to prior art in the Asserted Patents or related patents, the prosecution history of the Asserted Patents or related patents, and other admissions or statements obtained during discovery; and (4) foreign counterparts of any U.S. patents identified in the Preliminary Invalidity Contentions.

Where the Carriers identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure as well as any text relating to the figure in the remainder of the prior art reference (*e.g.*, for patent references, text in the specification and prosecution history). Similarly, where an identified portion of text refers to a figure or other material, the identification of the text should be understood to include the referenced figure or other material.

All related prior art references that are themselves subparts or related documents of a broader set of documents, such as all references that form part of a single release of an industry standard, should be considered a single prior art reference, as that is how a person of ordinary skill in the art would consider such related references.

F. Invalidity, Unenforceability And/Or Ineligibility Based On Non-Required Disclosure(s)

The Carriers reserve the right to prove the invalidity, unenforceability, and/or ineligibility of one or more of the Asserted Claims on bases other than those required to be disclosed in these disclosures pursuant to P.R. 3-3.

G. No Patentable Weight

The Carriers reserve the right to argue that various portions of the Asserted Claims, such as an intended use or result, non-functional descriptive material, and certain preamble language, are entitled to no patentable weight. Mapping of a portion of an Asserted Claim to a prior art

reference does not represent that such portion of the Claim is entitled to patentable weight when comparing the claimed subject matter to the prior art.

II. Invalidity Contentions

As explained herein and in Exhibits A to D, the Carriers contends that each of the Asserted Claims is invalid under 35 U.S.C. §§ 102, 103, and/or 112.

A. P.R. 3-3(a) – Identification Of Prior Art

Pursuant to P. R. 3-3(a), and subject to the Carriers' reservation of rights as stated herein, the Carriers identify the prior art that anticipates or renders obvious the Asserted Claims in the tables set forth below.[4] On information and belief, each listed reference qualifies as prior art to the Asserted Patents.

To the extent that any of the following are prior art, the Carriers reserve the right to rely upon (1) foreign counterparts of U.S. patents identified herein, (2) U.S. counterparts of foreign patents and foreign patent applications identified herein, and (3) U.S. and foreign patents and patent applications corresponding to articles and publications identified herein. The Carriers also reserve the right to rely upon parent or provisional patents or ancestor patents or patent applications from which any of the patents or patent applications identified herein claim priority as continuation, divisional, or continuation-in-part applications. Identifications of dates of publication are made based on currently available information and the Carriers reserve the right to rely upon an earlier date should evidence supporting an earlier date be discovered.

[4] The Carriers also hereby identify any systems or products that embody the technology described in any patent or publication identified in these Preliminary Invalidity Contentions. The Carriers reserve the right to rely on any documents or other evidence regarding any such systems or products.

1. Identification Of Prior Art

a) '359 Patent

Patent/Publication No./Document Name	Date of Issue/Publication/Priority[5]
3GPP TS 38.213 V15.2.0	June 29, 2018
3GPP TS 38.331 V15.2.0	June 20, 2018
3GPP TS 38.331 V15.0.0	January 4, 2018
R2-1714126, 38331-030, 3GPP TSG RAN WG2 ("R2-1714126")	November 30, 2017
R1-1718834, Summary of key aspects for search space, 3GPP RAN WG1 ("R1-1718834")	October 9, 2017
U.S. Patent No. 11,025,456	January 12, 2018
U.S. Patent No. 10,680,779	August 11, 2017
U.S. Patent Publication No. 2018/0324770	May 4, 2017
U.S. Patent No. 10,945,251	November 15, 2017
U.S. Patent No. 11,272,566	January 11, 2018

[5] For any patent that claims the benefit of a provisional application(s), the Carriers may rely on the provisional application(s) for purposes of establishing invalidity. The Carriers may also rely upon the date of filing of any issued patent or patent application to show the priority date of that reference.

b) **’402 Patent**

Patent/Publication No./Document Name	Date of Issue/Publication/Priority[6]
International Patent Publication No. WO 2017/146758 A1 (“Chang ’758”)	February 25, 2016
U.S. Patent Publication No. 2017/0047976 A1 (“Noh ’976”)	August 13, 2015
U.S. Patent Publication No. 2016/0277954 A1 (“Frenne ’954”)	October 10, 2014
U.S. Patent Publication No. 2013/0286960 A1 (“Li ’960”)	April 30, 2012
International Patent Publication No. WO 2017/142573 A1 (“Moon ’573”)	February 18, 2016
R1-1608817, DL RS design for NR CSI acquisition and beam management, 3GPP RAN WG1 (“R1-1608817”)	October 10, 2016
R1-1608931, Remaining Details of Aperiodic CSI-RS and Overhead Reduction, 3GPP RAN WG1 (“R1-1608931”)	October 10, 2016
R1-1609024, Discussions on CDM-4/-8 for non-precoded CSI-RS, 3GPP RAN WG1 (“R1-1609024”)	October 10, 2016
R1-1609528, Discussion on CSI-RS design for NR, 3GPP RAN WG1 (“R1-1609528”)	October 10, 2016
R1-1609763, Aperiodic CSI and CSI-RS resource pooling, 3GPP RAN WG1 (“R1-1609763”)	October 10, 2016
R1-1611242, DL RS Design for NR Beam Management, 3GPP RAN WG1 (“R1-1611242”)	November 14, 2016
R1-1611412, Discussion on measurement related reference signals, 3GPP RAN WG1 (“R1-1611412”)	November 14, 2016
R1-162346, Enhancements on Beamformed CSI-RS, 3GPP RAN WG1 (“R1-162346”)	April 11, 2016
R1-167675, Aperiodic CSI-RS transmission for beamformed CSI-RS, 3GPP RAN WG1 (“R1-167675”)	August 22, 2016
3GPP TS 36.211 V14.0.0	September 29, 2016
3GPP TS 36.211 V13.3.0	September 29, 2016
3GPP TS 36.331 V14.0.0	October 4, 2016
3GPP TS 36.331 V13.3.0	October 3, 2016
3GPP TS 36.300 V14.0.0	September 29, 2016
3GPP TS 36.300 V13.5.0	September 29, 2016
3GPP TS 36.214 V14.0.0	September 29, 2016
3GPP TS 36.214 V13.3.0	September 29, 2016

c) **’868 Patent**

Patent/Publication No./Document Name	Date of Issue/Publication/Priority[7]
U.S. Patent Publication No. 2017/0180099 A1 (“Kim ’099”)	March 28, 2014
U.S. Patent No. 10,135,512 (“Stirling-Gallacher ’512”)	April 6, 2016
U.S. Patent No. 11,096,195 (“Xiong ’195”)	February 11, 2016
U.S. Patent No. 10,367,677 (“Parkvall ’677”)	May 13, 2016
U.S. Patent Publication No. 2020/0145079 A1 (“Marinier ’079”)	June 2, 2016
European Patent No. 3,280,068 (“Zhang ’068”)	April 17, 2015
U.S. Patent Publication No. 2017/0207843 (“Jung ’843”)	January 14, 2016
U.S. Patent Publication No. 2019/0058518 A1 (“Koskela ’518”)	March 24, 2016
R1-165564, WF on UE beamforming and beam management, 3GPP RAN WG1 (“R1-165564”)	May 30, 2016
3GPP TS 36.321 V13.1.0	April 1, 2016
3GPP TS 36.300 V13.3.0	April 1, 2016
3GPP TS 36.101 V14.0.0	July 8, 2016
3GPP TS 36.101 V13.3.0	March 31, 2016
3GPP TS 36.306 V13.1.0	April 1, 2016
3GPP TS 36.331 V13.1.0	April 1, 2016
3GPP TS 36.213 V13.1.1	March 31, 2016

[6] For any patent that claims the benefit of a provisional application(s), the Carriers may rely on the provisional application(s) for purposes of establishing invalidity. The Carriers may also rely upon the date of filing of any issued patent or patent application to show the priority date of that reference.

[7] For any patent that claims the benefit of a provisional application(s), the Carriers may rely on the provisional application(s) for purposes of establishing invalidity. The Carriers may also rely upon the date of filing of any issued patent or patent application to show the priority date of that reference.

d) **'754 Patent**

Patent/Publication No./Document Name	Date of Issue/Publication/Priority[8]
U.S. Patent No. 10,959,124	March 23, 2017
U.S. Patent No. 10,959,240	March 7, 2017
U.S. Patent No. 10,462,700	February 1, 2017
3GPP TS 38.300 V0.4.1	June 12, 2017
3GPP TS 37.324 V0.1.0	July 21, 2017
R2-1706381, SDAP header format, 3GPP TSG RAN WG2 ("R2-1706381")	June 27, 2017
R2-1704250, Discussion on QoS mapping, 3GPP TSG RAN WG2 ("R2-1706381")	May 15, 2017

[8] For any patent that claims the benefit of a provisional application(s), the Carriers may rely on the provisional application(s) for purposes of establishing invalidity. The Carriers may also rely upon the date of filing of any issued patent or patent application to show the priority date of that reference.

2. Identification Of Prior Art Sales/Public Uses

Item Offered for Sale and/or Publicly Used	Date of Offer/Public Use	Person or Entity Who Made and Received Offer, Made Public Use, or Made Information Known
Any product that utilizes the 3GPP TS 38.213 standard	Prior to January 18, 2018	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 38.331 standard	Prior to January 18, 2018	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.211 standard	Prior to January 6, 2017	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.331 standard	Prior to January 6, 2017	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.300 standard	Prior to January 6, 2017	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.214 standard	Prior to January 6, 2017	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.321 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.300 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.101 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.306 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.331 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 36.213 standard	Prior to July 22, 2016	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 38.300 standard	Prior to July 24, 2017	Exemplary companies may include Nokia or Ericsson
Any product that utilizes the 3GPP TS 37.324 standard	Prior to July 24, 2017	Exemplary companies may include Nokia or Ericsson

B. P.R. 3-3(b) – Anticipation And Obviousness

Pursuant to P.R. 3-3(b), and subject to the Carriers' reservation of rights, the Carriers attach claim charts hereto that are directed to the prior art references that anticipate each of the Asserted Claims under 35 U.S.C. §§ 102(a), (b), (e), and/or (g), either expressly or inherently, and/or the prior art references that, in the alternative, would have rendered the Asserted Claims

obvious under 35 U.S.C. § 103. *See* Exs. A-D. Some claim charts also contain explanations about the motivation to combine the references. The combinations contained in the Carriers' claim charts are exemplary. Any prior art reference cited herein may be combined with any other reference to demonstrate the invalidity of any of the Asserted Claims, as set forth below and in Exhibits A to D.

To the extent any claim limitation is construed to have a similar meaning, or to encompass similar feature(s) and/or function(s), as any other claim limitation, the citations to prior art references for each of those claim limitations in the Carriers' claim charts are incorporated by reference with respect to each other.

The Carriers' claim charts provide exemplary citations to the prior art references that teach or suggest every element of the Asserted Claims. To the extent that an element of an Asserted Claim is not shown in a chart, the Asserted Claims would have been obvious based on a combination of one or more other prior art references, as set forth below and in Exhibits A to D.

Much of the art cited in these Preliminary Invalidity Contentions reflects common knowledge and the state of the art at the time of the earliest filing date of the Asserted Patents. The Carriers may rely on additional citations, references, expert testimony, and other material to provide context or aid in understanding the cited portions of the references and/or cited features of the systems. The Carriers may also rely on expert testimony explaining relevant portions of references, relevant hardware or software products or systems, and other discovery regarding these subject matters. Additionally, the Carriers may rely on other portions of any prior art reference or other references relied on by the same authors or describing the same systems for purposes of explaining the background and general technical subject area of the reference.

Where an individual reference is cited with respect to all elements of an Asserted Claim, the Carriers contend that the reference anticipates the claim under 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and also renders the claim obvious under 35 U.S.C. § 103, both by itself in view of the knowledge of a person of ordinary skill in the art and in combination with the other cited references to the extent the reference is not found to disclose one or more claim elements. A single prior art reference, for example, can establish obviousness where the differences between the disclosures within the reference and the claimed invention would have been obvious to one of ordinary skill in the art. For example, "[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness." *Boston Sci. Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991 (Fed. Cir. 2009). To the extent Plaintiffs contend that an embodiment within a particular item of prior art does not fully disclose all limitations of a claim, the Carriers reserve the right to rely on other embodiments in that prior art reference, or other information, to show single reference obviousness under 35 U.S.C. § 103(a).

Where an individual reference is cited with respect to fewer than all elements of an Asserted Claim, the Carriers contend that the reference renders obvious the claim under 35 U.S.C. § 103(a) in view of each other reference and combination of references that discloses the remaining claim element(s), as indicated in the claim charts submitted herewith. "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

Exemplary motivations to combine references are discussed below and in the accompanying charts. The Carriers reserve the right to rely upon any references or assertions identified herein in connection with their contentions that each Asserted Claim is invalid under 35 U.S.C. § 103 and to rely upon expert testimony addressing such references and assertions. The fact that prior art is identified to anticipate the Asserted Claims presents no obstacle in also relying on that reference as a basis for invalidity based on obviousness. "[A] rejection for obviousness under § 103 can be based on a reference which happens to anticipate the claimed subject matter." *In re Meyer*, 599 F.2d 1026, 1031 (C.C.P.A. 1979). To the extent any cited prior art item may not fully disclose a limitation of an Asserted Claim or is alleged by Plaintiffs to lack disclosure of the limitation, such limitation is present and identified in another prior art item as shown in the attached claim charts.

Many of the cited references cite or relate to additional references and/or products, services, or projects. Many of the cited references also cite software, hardware, or systems. The Carriers may rely upon such cited additional references and/or products and copies or exemplars of such software, hardware, or systems. The Carriers will produce or make available for inspection any such cited references, products, software, hardware, or systems that they intend to rely upon. The Carriers may also rely upon the disclosures of the references cited and/or discussed during the prosecution of the Asserted Patents and/or the assertions presented regarding those references.

The Carriers reserve the right to further streamline and reduce the number of anticipation or obviousness references relied upon with respect to a given Asserted Claim and to exchange or otherwise modify the specific references relied upon for anticipation and within each obviousness combination for each Asserted Claim.

C. P.R. 3-3(c) – Claim Charts

The Carriers attach the following claim charts pursuant to P.R. 3-3(c):

Asserted Patent	Claim Chart Exhibits
’359 Patent	Exs. A-1 – A-10
’402 Patent	Exs. B-1 – B-14
’868 Patent	Exs. C-1 – C-8
’754 Patent	Exs. D-1 – D-7

The attached claim charts are based, in whole or in part, on Plaintiffs’ asserted theories of infringement in this case, to the extent discernible from Plaintiffs’ Infringement Contentions. All portions of each prior art reference cited in each of the attached claim charts are relied upon to support the disclosure of each patent claim limitation, as all portions provide general support. Representative descriptions and supporting citations are nevertheless provided, but are merely exemplary; they do not necessarily reflect every instance where a particular claim term or claim limitation may be disclosed in or taught by the prior art reference. References to figures or drawings refer to the figures/drawings themselves and any accompanying text or text necessary to understand the figures or drawings. References to text refers to the text itself and the figures or drawings that accompany the text. The Carriers reserve the right to rely on additional, or different, portions of the prior art references, other publications, and expert testimony to establish what these references would have taught one of ordinary skill in the art, or in what manner they would have motivated a particular combination of references.

In certain instances, representative documents for certain prior art systems are cited, but again, they are merely exemplary; they do not necessarily reflect or include every document relating to the prior art system that exists and that discloses or teaches a particular claim term or claim limitation.The Carriers reserve the right to rely on any and all documents that describe or relate to prior art systems, including relying on the system itself. The Carriers also reserve the

right to rely on the testimony of the authors, named inventors, or anyone else with knowledge of the prior art references and systems identified herein, as well as expert testimony regarding any such references or systems.

D. Obviousness And Motivation To Combine

The primary references identified above, and as further described in Exhibits A to D, each disclose, either expressly or inherently, every element of the Asserted Claims, thereby anticipating those claims. To the extent Plaintiffs contend that any primary reference does not anticipate the Asserted Claims, it would have been obvious to combine or modify the primary references with concepts from other prior art, as explained herein and in the following Exhibits:

Asserted Patent	Claim Chart Exhibits
’359 Patent	Ex. A
’402 Patent	Ex. B
’868 Patent	Ex. C
’754 Patent	Ex. D

In particular, for each limitation of the Asserted Claims that Plaintiffs contend is not met by a particular primary reference, the Carriers contend that the limitation (and Claim as a whole) is obvious based on a combination of that particular primary reference with (1) any other primary reference disclosing that limitation, (2) any admitted prior art, as explained in the background of each patent or discussed in the file history, (3) any reference identified in Exhibits A to D as disclosing that limitation, (4) the knowledge of a person of ordinary skill in the art, and/or (5) any of the references and concepts discussed herein regarding the relevant background and state of the art. The specific combinations of prior art that the Carriers contend render the Asserted Claims obvious are readily determinable as described herein, which is the most efficient manner of identifying the combinations in light of the fact that Plaintiffs have asserted 44 claims across 4 patents. The Carriers’ obviousness grounds for each dependent claim incorporate the

obviousness grounds for the claim(s) from which the dependent claim depends in addition to any obviousness grounds identified in the charts for the dependent claim.

The Carriers do not yet have the benefit of Plaintiffs' positions on the prior art, including what (if any) elements they contend are missing in each prior art reference, whether Plaintiffs agree that a reference is in fact prior art, and whether Plaintiffs agree that a person of ordinary skill in the art would be motivated to combine specific references. The Carriers reserve the right to supplement these obviousness positions (including identifying additional prior art combinations and the associated reasons to combine) as discovery as the case progresses, including expert discovery.

1. Background and State Of The Art

The Carriers set forth below a summary of their current understanding of the state of the art as understood as of the asserted priority dates of the Asserted Patents for the general subject matter of each of the Asserted Patents. The information discussed in this section may have formed the background knowledge of a person of ordinary skill in the art at the time the Asserted Patents were filed and may have been used in determining whether and how to combine references to achieve the claimed inventions. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) ("[T]he knowledge of [a person of ordinary skill in the art] is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious."). The subject matter of the Asserted Claims was understood to those of skill in the art by the alleged priority dates of the Asserted Patents. In order to describe the state of the art at the alleged priority date, Defendants rely on at least the references listed below, as well as the references listed on the face of the Asserted Patents and all other references contained herein. The Carriers expressly reserve the right to rely on each of the prior art references, systems, concepts, and technologies discussed in this section with respect to each of the Asserted Patents.

The Carriers contend that, to the extent the primary references identified in these Preliminary Invalidity Contentions do not anticipate the Asserted Claims, it would have been obvious to combine any of the references, systems, concepts, or technologies discussed in this section with those primary references. The Carriers also reserve the right to rely on the discussions of the state of the art and prior art in each of the Asserted Patent specifications and their file histories including foreign file histories of related patents in explaining the state of the art. The Carriers further expressly reserve the right to supplement their summary of the background and state of the art, including, for example, (1) with information from any of the authors or named inventors on any of the prior art references, (2) by personnel familiar with systems based on any of the prior art references, or any prior art systems related to prior art references, or (3) by technical experts retained on behalf of any party. The Carriers also expressly reserve the right to rely on any admissions or statements by any of the named inventors, institutions with which they were associated, and Plaintiffs, regarding the state of the art.

a) **Background And State Of The Art Related To The '359 Patent**

The subject matter of the Asserted Claims of the '359 Patent was understood to those of skill in the art by the alleged priority dates of the patent. In order to describe the state of the art at the alleged priority date, the Carriers rely on at least the references listed below, as well as the references listed on the face of the Asserted Patents and all other references contained herein and the exhibits hereto.

State of the Art Reference	Publication/Issue/Priority Date
3GPP TS 38.213 V15.0.0	January 3, 2018
3GPP TS 38.331 V15.0.0	January 4, 2018
U.S. Patent Publication No. 2014/0112283	June 15, 2011
U.S. Patent No. 9,462,582	November 7, 2011
U.S. Patent Publication No. 2018/0049203	August 11, 2016

U.S. Patent Publication No. 2018/0123759	May 14, 2015
U.S. Patent Publication No. 2019/0149275	January 12, 2018
U.S. Patent Publication No. 2019/0159226	November 17, 2017
U.S. Patent Publication No. 2020/0015176	March 24, 2017
RP-172570, TS 38.331 v1.0.0 on NR; Radio Resource Control (RRC) Protocol specification, 3GPP TSG RAN WG1	December 14, 2017
RP-172703, TS 38.213 on NR; Physical layer procedures for control, 3GPP TSG RAN WG1	December 15, 2017
RP-172511, Motivation for new WI: Enhancements on scheduling and control for NR, 3GPP TSG RAN WG1	December 11, 2017
RP-172512, New WID proposal: Enhancements on scheduling and control for NR, 3GPP TSG RAN WG1	December 11, 2017
R1-1717062, CORESET configuration and search space design, 3GPP TSG RAN WG1	October 2, 2017
R1-1717379, CORESETs and search spaces in NR, 3GPP TSG RAN WG1	October 3, 2017
R1-1717511, CORESET configuration and Search space for NR-PDCCH, 3GPP TSG RAN WG1	October 2, 2017
R1-1717876, Discussion on common CORESET design, 3GPP TSG RAN WG1	September 30, 2017
R1-1717927, RMSI delivery and CORESET configuration, 3GPP TSG RAN WG1	October 3, 2017
R1-1718283, Configuration of CORESET and search space design, 3GPP TSG RAN WG1	October 2, 2017
R1-1718323, Discussions on search space and CORESET designs, 3GPP TSG RAN WG1	October 3, 2017
R1-1718488, Search space design and CORESET configuration, 3GPP TSG RAN WG1	October 3, 2017
R1-1718602, On the CORESET configuration and search space design, 3GPP TSG RAN WG1	October 2, 2017

b) **Background And State Of The Art Related To The ’402 Patent**

The subject matter of the Asserted Claims of the ’402 Patent was understood to those of skill in the art by the alleged priority dates of the patent. In order to describe the state of the art at the alleged priority date, the Carriers rely on at least the references listed below, as well as the

references listed on the face of the Asserted Patents and all other references contained herein and the exhibits hereto.

Patent/Publication No./Document Name	Date of Issue/Publication/Priority
International Patent Publication No. WO 2017/146758 A1 ("Chang '758")	February 25, 2016
U.S. Patent Publication No. 2017/0047976 A1 ("Noh '976")	August 13, 2015
U.S. Patent Publication No. 2016/0277954 A1 ("Frenne '954")	October 10, 2014
U.S. Patent Publication No. 2013/0286960 A1 ("Li '960")	April 30, 2012
International Patent Publication No. WO 2017/142573 A1 ("Moon '573")	February 18, 2016
R1-1608817, DL RS design for NR CSI acquisition and beam management, 3GPP RAN WG1 ("R1-1608817")	October 10, 2016
R1-1608931, Remaining Details of Aperiodic CSI-RS and Overhead Reduction, 3GPP RAN WG1 ("R1-1608931")	October 10, 2016
R1-1609024, Discussions on CDM-4/-8 for non-precoded CSI-RS, 3GPP RAN WG1 ("R1-1609024")	October 10, 2016
R1-1609528, Discussion on CSI-RS design for NR, 3GPP RAN WG1 ("R1-1609528")	October 10, 2016
R1-1609763, Aperiodic CSI and CSI-RS resource pooling, 3GPP RAN WG1 ("R1-1609763")	October 10, 2016
R1-1611242, DL RS Design for NR Beam Management, 3GPP RAN WG1 ("R1-1611242")	November 14, 2016
R1-1611412, Discussion on measurement related reference signals, 3GPP RAN WG1 ("R1-1611412")	November 14, 2016
R1-162346, Enhancements on Beamformed CSI-RS, 3GPP RAN WG1 ("R1-162346")	April 11, 2016

R1-167675, Aperiodic CSI-RS transmission for beamformed CSI-RS, 3GPP RAN WG1 ("R1-167675")	August 22, 2016
3GPP TS 36.211 V14.0.0	September 29, 2016
3GPP TS 36.211 V13.3.0	September 29, 2016
3GPP TS 36.331 V14.0.0	October 4, 2016
3GPP TS 36.331 V13.3.0	October 3, 2016
3GPP TS 36.300 V14.0.0	September 29, 2016
3GPP TS 36.300 V13.5.0	September 29, 2016
3GPP TS 36.214 V14.0.0	September 29, 2016
3GPP TS 36.214 V13.3.0	September 29, 2016
Final Minutes Report RAN1#87	February 13, 2017
Final Minutes Report RAN1#87	February 13, 2017
R1-168046, 3GPP RAN WG1	August 28, 2016
R1-1608780, 3GPP RAN WG1	October 10, 2016
R1-1609097, 3GPP RAN WG1	October 10, 2016
R1-1609199, 3GPP RAN WG1	October 10, 2016
R1-1609516, 3GPP RAN WG1	October 10, 2016
R1-1609754, 3GPP RAN WG1	October 10, 2016
R1-1609763, 3GPP RAN WG1	October 10, 2016
R1-1609765, 3GPP RAN WG1	October 10, 2016
R1-1609766, 3GPP RAN WG1	October 10, 2016
R1-1609924, 3GPP RAN WG1	October 10, 2016
R1-1610102, 3GPP RAN WG1	October 10, 2016
R1-1610245, 3GPP RAN WG1	October 10, 2016
R1-1610274, 3GPP RAN WG1	October 10, 2016
R1-1610275, 3GPP RAN WG1	October 10, 2016
R1-1611236, 3GPP RAN WG1	November 14, 2016
R1-1611474, 3GPP RAN WG1	November 14, 2016
R1-1611979, 3GPP RAN WG1	November 14, 2016

c) Background And State Of The Art Related To The '868 Patent

The subject matter of the Asserted Claims of the '868 Patent was understood to those of skill in the art by the alleged priority dates of the patent. In order to describe the state of the art at the alleged priority date, the Carriers rely on at least the references listed below, as well as the references listed on the face of the Asserted Patents and all other references contained herein and the exhibits hereto.

State of the Art Reference	Date of Issue/Publication/Priority
U.S. Patent Publication No. 2017/0180099 A1 ("Kim '099")	March 28, 2014
U.S. Patent No. 10,135,512 ("Stirling-Gallacher '512")	April 6, 2016
U.S. Patent No. 11,096,195 ("Xiong '195")	February 11, 2016
U.S. Patent No. 10,367,677 ("Parkvall '677")	May 13, 2016
U.S. Patent Publication No. 2020/0145079 A1 ("Marinier '079")	June 2, 2016
European Patent No. 3,280,068 ("Zhang '068")	April 17, 2015
U.S. Patent Publication No. 2017/0207843 ("Jung '843")	January 14, 2016
U.S. Patent Publication No. 2019/0058518 A1 ("Koskela '518")	March 24, 2016
R1-165564, WF on UE beamforming and beam management, 3GPP RAN WG1 ("R1-165564")	May 30, 2016
3GPP TS 36.321 V13.1.0	April 1, 2016
3GPP TS 36.300 V13.3.0	April 1, 2016
3GPP TS 36.101 V14.0.0	July 8, 2016
3GPP TS 36.101 V13.3.0	March 31, 2016
3GPP TS 36.306 V13.1.0	April 1, 2016
3GPP TS 36.331 V13.1.0	April 1, 2016
3GPP TS 36.213 V13.1.1	March 31, 2016
Chairman's Notes RAN1 #86	August 22, 2016
R1-165365	May 23, 2016
R1-166270	August 22, 2016

d) **Background And State Of The Art Related To The '754 Patent**

The subject matter of the Asserted Claims of the '754 Patent was understood to those of skill in the art by the alleged priority dates of the patent. In order to describe the state of the art at the alleged priority date, the Carriers rely on at least the references listed below, as well as the references listed on the face of the Asserted Patents and all other references contained herein and the exhibits hereto.

State of the Art Reference	Publication/Issue/Priority Date
3GPP TS 38.300 V0.4.1	June 12, 2017
3GPP TS 37.324 V0.1.0	July 21, 2017
3GPP TS 38.912 V14.0.0	March 24, 2017
3GPP TS 38.331 V0.0.4	June 16, 2017
W.O. Patent Publication No. 2018/026169	August 1, 2016
W.O. Patent Publication No. 2018/031081	August 8, 2016

U.S. Patent Publication No. 2018/0146398	November 4, 2016
U.S. Patent Publication No. 2019/0029057	July 24, 2017
U.S. Patent Publication No. 2019/0028920	July 20, 2017
U.S. Patent Publication No. 2019/0150023	February 1, 2017
U.S. Patent Publication No. 2019/0357093	January 5, 2017
U.S. Patent No. 10,492,096	May 8, 2017
U.S. Patent Publication No. 2020/0037197	March 22, 2017
U.S. Patent Publication No. 2020/0084003	May 5, 2017
U.S. Patent Publication No. 2020/0100136	June 16, 2017
U.S. Patent Publication No. 2020/0128430	January 13, 2017
R2-1706783, QoS Flow ID in SDAP, 3GPP TSG RAN WG2	June 17, 2017
R2-1706784, Use of Shorter QoS Flow ID, 3GPP TSG RAN WG2	June 17, 2017
R2-1706817, Location of QoS Flow ID in UL and DL packet, 3GPP TSG RAN WG2	June 16, 2017
R2-1706850, Configurability for UL QoS flow ID marking, 3GPP TSG RAN WG2	June 16, 2017
R2-1706875, Consideration on QoS flow ID, 3GPP TSG RAN WG2	June 16, 2017
R2-1706999, QoS flow ID presence in the AS Reflective QoS, 3GPP TSG RAN WG2	June 17, 2017
R2-1706951, New BSR triggering for default DRB, 3GPP TSG RAN WG2	June 16, 2017
R2-1707506, LS on default DRB establishment for PDU session, 3GPP TSG RAN WG2	July 18, 2017
R2-1706782, SDAP Header Format, 3GPP TSG RAN WG2	June 17, 2017
R2-1706798, Further considerations of SDAP header, 3GPP TSG RAN WG2	June 17, 2017
R2-1706994, SDAP header format optimization, 3GPP TSG RAN WG2	June 17, 2017
R2-1707159, SDAP Header Format, 3GPP TSG RAN WG2	June 16, 2017
R2-1707351, SDAP Header Format, 3GPP TSG RAN WG2	June 17, 2017
R2-1707509, Draft TS for 3GPP SDAP specification (37.324), 3GPP TSG RAN WG2	July 25, 2017

2. Motivation To Combine

Each prior art reference may be combined with one or more other prior art references to render obvious the Asserted Claims in combination, as explained in more detail below. The

disclosures of these references also may be combined with information known to persons skilled in the art at the time of the alleged invention, and understood and supplemented in view of the common sense of persons skilled in the art at the time of the alleged invention, including any statements in the intrinsic record of the Asserted Patents and related applications.

A person of ordinary skill would have been motivated to combine the prior art cited in the attached claim charts based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. The identified prior art references, including portions cited in the claim charts, address the same or similar technical issues and suggest the same or similar solutions to those issues as the Asserted Claims. On such bases, on an element-by-element basis, the Carriers intend to combine one or more prior art references identified in the claim charts attached as Exhibits A to D with each other to address any contention from Plaintiffs that a particular prior art item supposedly lacks one or more elements of an Asserted Claim. In other words, the Carriers contend that each charted prior art reference can be combined with other charted prior art references when a particular prior art item lacks or does not explicitly disclose an element or feature of an Asserted Claim.

A motivation, teaching, or suggestion to combine the prior art identified exists for each obviousness combination identified above. In *KSR International Co. v. Teleflex Inc., et al.*, 550 U.S. 398 (2007), the Supreme Court held that a claimed invention can be obvious even if there is no teaching, suggestion, or motivation for combining the references to produce the claimed invention. *KSR* holds that patents that are based on new combinations of elements or components already known in a technical field may be found obvious. Specifically, the Court rejected a rigid application of the "teaching, suggestion, or motivation [to combine] test." *Id.* at 407, 418-419. "In determining whether the subject matter of a patent claim is obvious, neither the particular

motivation nor avowed purpose of the patentee controls. What matters is the objective reach of the claim." *Id.* at 419. "Under the correct analysis, any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 420. The Court noted that "[c]ommon sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 416. A key inquiry is whether the "improvement is more than the predictable use of prior art elements according to their established function." *Id*. at 417. "When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." *Id.* at 421. "In that instance the fact that a combination was obvious to try might show that it was obvious under § 103." *Id*. Finally, the Supreme Court recognized that "[g]ranting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility." *Id*. at 419.

Based on *KSR,* the USPTO issued a set of Examination Guidelines. *See* Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex, Inc.*, 72 Fed. Reg. 57526 (Oct. 10, 2007). The

Guidelines provide a variety of rationales on which to base a finding of obviousness. Those rationales are based on *KSR* and other precedent, and include:

(A) Combining prior art elements according to known methods to yield predictable results;

(B) Simple substitution of one known element for another to obtain predictable results;

(C) Use of known technique to improve similar devices (methods, or products) in the same way;

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) "Obvious to try" –choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) 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 would have been predictable to one of ordinary skill in the art;

(G) 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.

Id. at 57529. The Carriers contend that one or more of these rationales apply in considering the obviousness of the Asserted Claims.

Additional evidence establishing that there would have been a motivation to combine the prior art references identified above includes (1) the interrelated teachings of multiple prior art references, (2) the effects of demands known to the design community or present in the marketplace, (3) the existence of a known problem for which there was an obvious solution encompassed by the Asserted Claims, (4) the existence of a known need or problem in the field of the endeavor at the time of the invention(s), and (5) the background knowledge that would have been possessed by a person having ordinary skill in the art.

Further, the prior art references explicitly or implicitly reference other prior art references, share common authors or inventors, were published in the same journals, presented at the same conferences, presented as proposals to standards working groups, and/or were developed at common companies, schools, or organizations, all of which would motivate one of skill in the art to combine them. These references are also within the field of the Asserted Patents and are directed to similar subject matter within that field. Additionally, any products, devices, or processes described in the references existed and/or were invented before or during the period in which the claimed inventions were developed, providing further motivation to combine them.

Thus, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and (1) the nature of the problem being solved, (2) the express, implied, and inherent teachings of the prior art, (3) the knowledge of persons of ordinary skill in the art, (4) the fact that the prior art is generally directed toward methods and systems for processing wireless signals, and (5) the predictable results obtained in combining the different elements of the prior art. Additionally, one would be motivated to address at least the alleged problems or achieve the purported objectives identified in the description of the Asserted Patents. *See, e.g.*, *infra* Section D.2.a-d. Moreover, the references charted in the Invalidity Contentions recognized and solved these problems.

Any reference or combination of references that anticipates or makes obvious an asserted independent claim also makes obvious any asserted claim dependent on that independent claim because every element of each dependent claim was known by a person of ordinary skill at the time of the alleged invention, and it would have been obvious to combine those known elements with the independent claims at least as a matter of common sense and routine innovation. Accordingly, the Carriers contend that each asserted claim would have been obvious not only by

the combinations explicitly defined in these contentions, but also by any combination of references that renders obvious an asserted claim.

Numerous prior art references, including those identified above and in the claim charts, reflect common knowledge and the state of the prior art prior to the priority dates of the Asserted Patents. As it would be unduly burdensome to create detailed claim charts for the thousands of invalidating combinations, the Carriers have provided examples of such invalidating combinations. As such, the Carriers' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate.

For each proposed combination of references described herein and in the attached exhibits and appendices hereto, because (i) there was a reason to make each combination, (ii) each combination of art would have produced no unexpected results, and/or (iii) each combination at most would simply represent a known alternative to one of ordinary skill in the art, no showing of a specific motivation to combine prior art is required. *See KSR*, 550 U.S. at 414–18 (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test instead espousing an "expansive and flexible" approach).

The various teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in Exhibits A to D, and Appendices A-1 to D-7 come from various sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obvious to try, the nature of the problem faced, and/or the knowledge possessed by one of ordinary skill in the art.

These exemplary combinations demonstrate that there were only a finite number of predictable solutions to known problems addressed by the Asserted Patents. Furthermore, known

work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of features found in the prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options, with each such option having a reasonable expectation of success. Additionally, one of ordinary skill in the art would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance and reliability, reduce costs, or predictably achieve other clearly desirable results.

To the extent Plaintiffs allege that any other claimed limitation or limitations are not disclosed in any primary reference, it would have been obvious to combine the teachings of the reference with the background knowledge of a person of ordinary skill in the art and/or it would have been obvious to incorporate the missing limitation(s), including as disclosed in Exhibits A to D, and Appendices A-1 to D-7 into the primary reference for the reasons disclosed herein. For example, one of ordinary skill in the art would have found substantial motivation to combine one or more of the primary references with one or more of each other or the state of the art (as described in the state of the art references listed below) in order to disclose the alleged inventions recited in the Asserted Claims. Each of the references disclosed herein as invalidating an Asserted Patent was directed at the same or similar field of technology and the same or similar problem as that Asserted Patent. To the extent Plaintiffs allege that any particular claim

limitation is not disclosed or inherent in the charted references, it would have been obvious to combine the charted reference with one or more of the references identified herein for the particular claim limitations.

As the Carriers are currently unaware of the extent, if any, to which Plaintiffs will contend that limitations of the Asserted Claims are not disclosed in the art identified herein as anticipatory, the Carriers reserve the right to identify other references and combinations that may render an allegedly missing limitation obvious. In addition, if and to the extent that Plaintiffs challenge the relevance of any of these references with respect to particular limitations of the Asserted Claims of the Asserted Patents, the Carriers reserve their right to identify further motivation(s) to combine particular references with additional particularity.

The suggested obviousness combinations discussed herein are not to be construed to suggest that any reference included in the combinations is not anticipatory. Further, to the extent Plaintiffs contend any of the anticipatory prior art fails to disclose one or more limitations of the Asserted Claims, the Carriers reserve the right to identify other prior art references that, when combined with the anticipatory prior art, would render the claims obvious despite an allegedly missing limitation. The Carriers will further specify the motivations to combine the prior art, including through reliance on expert testimony, at the appropriate later stage of this lawsuit.

The Carriers further contend that the prior art identified in these Preliminary Invalidity Contentions is evidence of simultaneous or near-simultaneous independent invention by others of the alleged invention as recited in one or more of the Asserted Claims. The Carriers reserve the right to rely on the simultaneous or near-simultaneous independent invention by others as further evidence of the obviousness of the Asserted Claims.

Each limitation of the Asserted Claims was well-known to those of ordinary skill in the art at the time. At best, the elements recited in the Asserted Claims are mere combinations and modifications of these well-known elements. A person of ordinary skill in the art would be able and motivated to improve the existing technology in the same or similar manner by combining or modifying the individual elements that were already known in the art to yield predictable results.

The Carriers reserve the right to present expert testimony on, among other things, the teachings, suggestions, motivations, and/or reasons to modify any of the references and/or to combine any two or more of the prior art references presented in Exhibits A to D.

3. Secondary Considerations

A patentee bears the burden of production with respect to evidence of secondary considerations of non-obviousness. *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018). As of the date of these Preliminary Invalidity Contentions, Plaintiffs have not yet identified any evidence of secondary considerations. The Carriers reserve all rights to further respond to any secondary considerations of non-obviousness raised by Plaintiffs, including by updating, modifying, and/or adding to these Preliminary Invalidity Contentions. The Carriers are not aware of any unexpected results (none is mentioned in the Asserted Patents or their file histories), long felt need, commercial success (or any nexus to any allegedly successful commercial embodiment), or awards for the alleged inventions of the Asserted Patents.

Moreover, secondary considerations of nonobviousness "simply cannot overcome a strong prima facie case of obviousness." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). For any secondary consideration to be relevant, Plaintiffs must establish a nexus between the secondary consideration and the claimed inventions. *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311-12 (Fed. Cir. 2006). Plaintiffs have not provided any evidence of any secondary considerations, much less any nexus between such secondary considerations and the

claimed inventions of the Asserted Patents. The Carriers contend that no secondary considerations evidence exists that supports the validity of any Asserted Claim and reserve all rights to respond to any argument or evidence presented by Plaintiffs regarding any alleged secondary considerations of non-obviousness.

E. P.R. 3-3(d): Invalidity Under 35 U.S.C. § 112

As set forth below, the Carriers contend that the Asserted Claims are invalid under 35 U.S.C. § 112 because the claims (1) are indefinite, (2) fail to satisfy the enablement requirement, and/or (3) fail to satisfy the written description requirement.

The Carriers' invalidity contentions for the Asserted Claims identified in this section are made in the alternative and do not constitute, and should not be interpreted as, admissions (1) regarding the construction or scope of the Asserted Claims or (2) that any of the Asserted Claims would not have been anticipated and/or obvious in light of the prior art.

Plaintiffs have not yet provided a claim construction for any of the terms or phrases that the Carriers anticipate will be in dispute. The Carriers, therefore, cannot provide a complete list of § 112 defenses because the Carriers do not know whether Plaintiffs will proffer a construction for certain terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification. The Carriers offer these contentions without prejudice to any position they may ultimately take as to any claim construction issues.

Accordingly, the Carriers reserve the right to supplement, amend, and/or modify these § 112 invalidity contentions as discovery progresses.

1. Invalidity Under 35 U.S.C. § 112, ¶ 1

35 U.S.C. § 112, ¶ 1 requires that the specification contain a written description of the invention. "[T]he hallmark of written description is disclosure." *Boston Sci. Corp. v. Johnson &*

Johnson, 647 F.3d 1353, 1361–62 (Fed. Cir. 2011) (citation omitted). The test for whether a specification adequately describes an invention is "whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date . . . . [T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art . . . [It] is a question of fact." *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*); *Boston Scientific*, 647 F.3d at 1362.

The enablement requirement of § 112 demands that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). "[T]he scope of the claims must be less than or equal to the scope of the enablement." *Nat'l Recovery Tech., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999).

The Carriers contend that the following Asserted Claims are invalid under 35 U.S.C. § 112, ¶ 1. Each Asserted Claim identified below (and each Asserted Claim that depends therefrom) is invalid under ¶ 1 because the specification of the Asserted Patent fails to provide a sufficient written description, enabling disclosure, and/or fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention and/or the meaning of the term(s) and/or phrase(s). For each listed term or phrase, the Carriers believe the term or phrase is invalid under § 112, ¶ 1, as is any limitation including such terms or phrases, for the same reason(s).

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and/or Enablement
'359 Patent	1	"transmitting a signal indicating at least a first duration and a bit map, wherein the first

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and/or Enablement
		duration is time duration of a control resource set (CORESET)"; "not allowing to transmit the signal such that an interval between any two bit positions with the value of one in the set of bit positions in the bit map is smaller than the first duration."
	2	"the network node is not allowed to transmit the signal indicating that the first duration is 2 and the bit map is 11000000000000."
	3	"the interval between two bit positions in the set in the bit map shall be larger than or equal to the first duration."
	4	"the network node is not allowed to transmit the signal such that interval between any bit position in the set in the bit map and the least significant bit position in the bit map is smaller than the first duration minus one."
	9	"the interval is the difference between two bit positions."
	11	"the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol."
	12	"transmitting a signal indicating at least a first duration and a bit map, wherein the first duration is time duration of a control resource set (CORESET)"; "not allowing to transmit the signal such that interval between any bit position with the value of one in the set of bit positions in the bit map and the least significant bit position in the bit map is smaller than the first duration minus one."
	13	"the network node is not allowed to transmit the signal indicating that the first duration is 2 and the bit map is 00000000000001."
	14	"the interval between a bit position in the set in the bit map and the least significant bit position in the bit map shall be larger than or equal to the first duration minus one."
	19	"the interval is the difference between two bit positions."
	21	"the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol."

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and/or Enablement
	22	"transmit a signal indicating at least a first duration and a bit map, wherein the first duration is time duration of a control resource set (CORESET)"; "not allowing to transmit the signal such that an interval between any two bit positions with the value of one in the set of bit positions in the bit map is smaller than the first duration."
	23	"the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol."
'402 Patent	1, 12	"wherein the control signal triggers aperiodical transmission of the reference signal for beam measurement"
	1, 12	"wherein the control signal includes a beam-related information for transmitting the reference signal for beam measurement"
	1, 12	"wherein the control signal . . . indicates how many symbols are used to carry the reference signal for beam measurement"
	2, 13	"wherein the beam-related information indicates at least a beam on which the reference signal for beam measurement is transmitted"
	3, 14	"wherein the beam-related information indicates a first beam"
	3, 14	"wherein the reference signal for beam measurement is transmitted on at least a refined beam of the first beam"
'868 Patent	5, 13	"selecting a network beam"
	5, 13	"to indicate a first information associated with the network beam"
	5, 13	"for the UE to derive, based on a beam reference signal of the network beam, a UE beam"
	5, 13	"a UE beam used to transmit a periodic Channel State Information (CSI) and to transmit a scheduling request"
	5, 13	"wherein the first signal is a Medium Access Control (MAC) signaling"
	5, 13	"using the network beam, mapped to the UE beam, to receive the periodic CSI and to receive the scheduling request"

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and/or Enablement
	6, 14	"transmitting a second signal indicating radio resources for the beam reference signal of the network beam and the periodic CSI"
	16, 18	"transmitting, to the UE, an indication of candidates of network beams for communication with the network node"
'754 Patent	2	"the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field."
	4	"the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network."
	5	"the network node is a base station (or gNB)."
	7	"the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field."
	9	"the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network."
	10	"the network node is a base station (or gNB)."

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

Claims are indefinite under 35 U.S.C. § 112, ¶ 2 when they "fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). To the extent an asserted apparatus claim includes both apparatus and method limitations, that claim is invalid for indefiniteness under § 112, ¶ 2 because it fails to identify or notify the public of what constitutes direct infringement. *See IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005).

In addition to the Carriers' reservation of rights stated above, the Carriers will present arguments as to indefiniteness through, *e.g.*, the *Markman* meet and confer and briefing process.

The Carriers contend that the following Asserted Claims are invalid under 35 U.S.C. § 112, ¶ 2. Each Asserted Claim identified below (and each Asserted Claim that depends

therefrom) is invalid under ¶ 2 because it fails to inform, with reasonable certainty, those skilled in the art about the scope of the claimed invention. For each listed term or phrase, the Carriers believe the term or phrase (as well as terms within any such phrase) is invalid under § 112, ¶ 2, and any limitation including such term or phrase is also indefinite.

Asserted Patent	Asserted Claim(s)	Indefinite Terms or Phrases
’359 Patent	2	“the network node is not allowed to transmit the signal indicating that the first duration is 2 and the bit map is 11000000000000.”
	3	“the interval between two bit positions in the set in the bit map shall be larger than or equal to the first duration.”
	4	“the network node is not allowed to transmit the signal such that interval between any bit position in the set in the bit map and the least significant bit position in the bit map is smaller than the first duration minus one.”
	9	“the interval is the difference between two bit positions.”
	11	“the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol.”
	12	“transmitting a signal indicating at least a first duration and a bit map, wherein the first duration is time duration of a control resource set (CORESET)”; “not allowing to transmit the signal such that interval between any bit position with the value of one in the set of bit positions in the bit map and the least significant bit position in the bit map is smaller than the first duration minus one.”
	13	“the network node is not allowed to transmit the signal indicating that the first duration is 2 and the bit map is 00000000000001.”
	14	“the interval between a bit position in the set in the bit map and the least significant bit position in the bit map shall be larger than or equal to the first duration minus one.”
	19	“the interval is the difference between two bit positions.”
	21	“the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol.”

Asserted Patent	Asserted Claim(s)	Indefinite Terms or Phrases
	22	"transmit a signal indicating at least a first duration and a bit map, wherein the first duration is time duration of a control resource set (CORESET)"; "not allowing to transmit the signal such that an interval between any two bit positions with the value of one in the set of bit positions in the bit map is smaller than the first duration."
	23	"the CORESET is monitored on a number of consecutive OFDM symbol provided by the first duration from the starting OFDM symbol."
'402 Patent	1, 12	"wherein the control signal triggers aperiodical transmission of the reference signal for beam measurement"
	1, 12	"wherein the control signal includes a beam-related information for transmitting the reference signal for beam measurement"
	1, 12	"wherein the control signal . . . indicates how many symbols are used to carry the reference signal for beam measurement"
	2, 13	"wherein the beam-related information indicates at least a beam on which the reference signal for beam measurement is transmitted"
	3, 14	"wherein the beam-related information indicates a first beam"
	3, 14	"wherein the reference signal for beam measurement is transmitted on at least a refined beam of the first beam"
'868 Patent	5, 13	"selecting a network beam"
	5, 13	"to indicate a first information associated with the network beam"
	5, 13	"for the UE to derive, based on a beam reference signal of the network beam, a UE beam"
	5, 13	"a UE beam used to transmit a periodic Channel State Information (CSI) and to transmit a scheduling request"
	5, 13	"wherein the first signal is a Medium Access Control (MAC) signaling"
	5, 13	"using the network beam, mapped to the UE beam, to receive the periodic CSI and to receive the scheduling request" / "use the network beam, mapped to the UE beam, to receive the periodic CSI and to receive the scheduling request"

Asserted Patent	Asserted Claim(s)	Indefinite Terms or Phrases
	6, 14	"transmitting a second signal indicating radio resources for the beam reference signal of the network beam and the periodic CSI" / "transmit a second signal indicating radio resources for the beam reference signal of the network beam and the periodic CSI"
	16, 18	"transmitting, to the UE, an indication of candidates of network beams for communication with the network node" / "transmit, to the UE, an indication of candidates of network beams for communication with the network node"
'754 Patent	2	"the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field."
	4	"the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network."
	5	"the network node is a base station (or gNB)."
	7	"the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field."
	9	"the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network."
	10	"the network node is a base station (or gNB)."

III. Accompanying Document Production

Pursuant to P.R. 3-4(a), the Carriers are producing documents sufficient to show the operation of any aspects or elements of each Accused Instrumentality identified by Plaintiffs in its P.R. 3-1(c) charts at Bates Ranges: ATT_CELERITY_00002301 - ATT_CELERITY_00011543; VERIZON_CELERITY_00001279 - VERIZON_CELERITY_00164632; and TMOBILE_CELERITY_00002193 - TMOBILE_CELERITY_02702797. Movant-Intervenors Ericsson and Nokia have additionally made source code available for inspection at McKool Smith's office in Dallas, Texas.

Finally, pursuant to P.R. 3-4(b), the Carriers are producing a copy of each prior art reference identified above pursuant to P.R. 3-3(a) which does not appear in the file histories of the Asserted Patents, as well as additional prior art references, at Bates Range: DEF_CELERITY_00000001 - DEF_CELERITY_00015617. To the extent any such prior art reference is not in English, the Carriers have produced or will produce an English translation of the portion(s) of the non-English prior art reference(s) relied upon by the Carriers.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on April 12, 2024, the foregoing document was served by electronic mail on all counsel of record.

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