

EXHIBIT C-4 to Defendants' Invalidity Contentions
Daingean Techs. v. AT&T Corp. et al., Case No. 2:23-cv-00123-JRG-RSP (E.D. Tex.)

**Invalidity of U.S. Patent No. 10,841,958 (“the 958 patent”) over
3GPP TS 36.331 v13.2.0 (“TS 36.331”)**

3GPP TS 36.331 v13.2.0, July 11, 2016 (“TS 36.331”) anticipates under at least 35 U.S.C. § 102(a)(1) and/or renders obvious under 35 U.S.C. § 103 claims 1, 2, 3, and 4 of U.S. Patent No. 10,841,958 (“the ’958 Patent”), alone or in combination with other references as indicated below and the knowledge of a person of ordinary skill in the art.

Claim	Grounds for Invalidity
1. [Pre] An access node of a radio access network that communicates over a radio interface with a wireless terminal, the access node comprising:	TS 36.331 teaches an access node of a radio access network that communicates over a radio interface with a wireless terminal. Illustrative citations showing disclosures of this element are reproduced below.

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Claim	Grounds for Invalidity
	4.1 Introduction In this specification, (parts of) procedures and messages specified for the UE equally apply to the RN for functionality necessary for the RN. There are also (parts of) procedures and messages which are only applicable to the RN in its communication with the E-UTRAN, in which case the specification denotes the RN instead of the UE. Such RN-specific aspects are not applicable to the UE. NB-IoT is a non backward compatible variant of E-UTRAN supporting a reduced set of functionality. In this specification, (parts of) procedures and messages specified for the UE equally apply to the UE in NB-IoT. There are also some features and related procedures and messages that are not supported by UEs in NB-IoT. In particular, the following features are not supported in NB-IoT and corresponding procedures and messages do not apply to the UE in NB-IoT: - Connected mode mobility (Handover and measurement reporting); - Inter-RAT cell reselection or Inter-RAT mobility in connected mode; - CSG; - Relay Node (RN); - Carrier Aggregation (CA); - Dual connectivity (DC); - GBR (QoS); - ACB, EAB, SSAC and ACDC; - MBMS; - Self-configuration and self-optimisation; - Measurement logging and reporting for network performance optimisation; - Public warning systems, e.g. CMAS, ETWS and PWS; - Real time services (including emergency call); - CS services and CS fallback; - In-device coexistence; - RAN assisted WLAN interworking; - Network-assisted interference cancellation/suppression; - Sidelink (including direct communication and direct discovery). NOTE: In regard to mobility, NB-IoT is a separate RAT from E-UTRAN. TS 36.331 at 4.1.

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Claim	Grounds for Invalidity
	10.1 General This section specifies RRC messages that are transferred between network nodes. These RRC messages may be transferred to or from the UE via another Radio Access Technology. Consequently, these messages have similar characteristics as the RRC messages that are transferred across the E-UTRA radio interface, i.e. the same transfer syntax and protocol extension mechanisms apply. TS 36.331 at 10.1. 10.2.1 General This section specifies RRC messages that are sent either across the X2- or the S1-Interface, either to or from the eNB, i.e. a single 'logical channel' is used for all RRC messages transferred across network nodes. The information could originate from or be destined for another RAT. TS 36.331 at 10.2.1.

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Claim	Grounds for Invalidity
	The following figure not only provides an overview of the RRC states in E-UTRA, but also illustrates the mobility support between E-UTRAN, UTRAN and GERAN. Figure 4.2.1-1: E-UTRA states and inter RAT mobility procedures, 3GPP The following figure illustrates the mobility support between E-UTRAN, CDMA2000 1xRTT and CDMA2000 HRPD. The details of the CDMA2000 state models are out of the scope of this specification. Figure 4.2.1-2: Mobility procedures between E-UTRA and CDMA2000 The inter-RAT handover procedure(s) supports the case of signalling, conversational services, non-conversational services and combinations of these. TS 36.331 at Figures 4.2.1-1 and 4.2.1-2.

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Claim	Grounds for Invalidity
	In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
[1.1] processor circuitry configured:	TS 36.331 teaches processor circuitry. Illustrative citations showing disclosures of this element are reproduced below. 5.1.2 General requirements The UE shall: 1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message; NOTE 1: E-UTRAN may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure. TS 36.331 5.1.2. In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.

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Claim	Grounds for Invalidity
	For example, to the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach processing circuitry, including U.S. Patent Publication No. 2019/0158988 (“Lee 988”) and U.S. Patent Publication No. 2018/0288683 (“Bendlin.”) A POSITA would appreciate that TS 36.331 teaches “processing” and would therefore require circuitry for performing the processing. A POSITA would have been motivated to supplement TS 36.331’s teaching identified above with other references that provide additional details related to circuitry to execute the disclosed processing, including Lee 988 and Bendlin. Further, a POSITA would be motivated by the teachings of these references to circuitry for performing the processing disclosed by the standard because both references relate to essential system information transmission in a wireless network. <i>See</i> Bendlin at [0095]-[0096] and Figure 10.

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Claim	Grounds for Invalidity
	Figure 10 example UE (800) The diagram illustrates the internal components of an example UE (800). On the left, an 'application circuitry (802)' and a 'storage medium (812)' are connected via bidirectional arrows to a central 'baseband circuitry (804)'. The baseband circuitry contains a 'DSP (804F)' and a 'CPU (804G)' at the top, followed by a vertical stack of processors: '2G baseband processor (804A)', '3G baseband processor (804B)', '4G baseband processor (804C)', '5G baseband processor (804D)', and 'other baseband processor (804E)'. To the right of the baseband circuitry is the 'radio frequency circuitry (806)', which includes 'mixer circuitry (806A)', 'amplifier circuitry (806B)', 'filter circuitry (806C)', and 'synthesizer circuitry (806D)'. A bidirectional arrow connects the baseband circuitry to the radio frequency circuitry. On the far right, a 'front-end module (808)' is connected to the radio frequency circuitry via a bidirectional arrow. The front-end module is connected to 'antenna(s) (810)', which are depicted as two vertical antenna structures with multiple elements. Bendlin at Figure 10. See also Lee 988 at [0185] and Figure 15.

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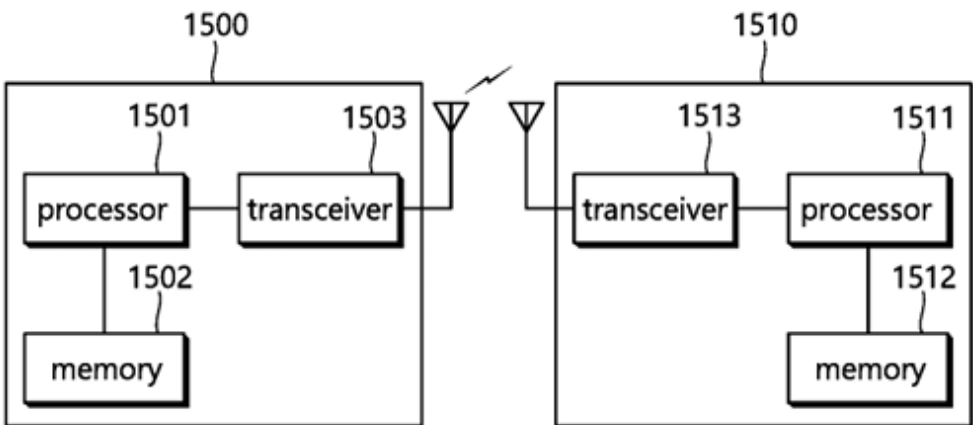
Claim	Grounds for Invalidity
	 Lee 988 at Figure 15, <i>see also</i> Lee 988 at [0037] (“FIG. 15 is a block diagram illustrating a wireless communication system according to the embodiment of the present invention. “)
[1.2] to generate a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by	TS 36.331 teaches generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network. Illustrative citations showing disclosures of this element are reproduced below.

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Claim	Grounds for Invalidity
broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;	5.2.1.1 General System Information is divided into the <i>MasterInformationBlock</i> (MIB) and a number of <i>SystemInformationBlocks</i> (SIBs). The MIB includes a limited number of most essential and most frequently transmitted parameters that are needed to acquire other information from the cell, and is transmitted on BCH. SIBs other than <i>SystemInformationBlockType1</i> are carried in <i>SystemInformation</i> (SI) messages and mapping of SIBs to SI messages is flexibly configurable by <i>schedulingInfoList</i> included in <i>SystemInformationBlockType1</i>, with restrictions that: each SIB is contained only in a single SI message, and at most once in that message; only SIBs having the same scheduling requirement (periodicity) can be mapped to the same SI message; <i>SystemInformationBlockType2</i> is always mapped to the SI message that corresponds to the first entry in the list of SI messages in <i>schedulingInfoList</i>. There may be multiple SI messages transmitted with the same periodicity. <i>SystemInformationBlockType1</i> and all SI messages are transmitted on DL-SCH. TS 36.331 at 5.2.1.1. When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE using a DRX cycle that is smaller than or equal to the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC_IDLE using a DRX cycle that is longer than the modification period acquires the updated system information immediately from the start of the next eDRX acquisition period. The UE applies the previously acquired system information until the UE acquires the new system information. The possible boundaries of modification for <i>SystemInformationBlockType1-BR</i> are defined by SFN values for which $\text{SFN mod } 512 = 0$ except for notification of ETWS/CMAS for which the eNB may change <i>SystemInformationBlockType1-BR</i> content at any time. For NB-IoT, the possible boundaries of modification for <i>SystemInformationBlockType1-NB</i> are defined by SFN values for which $(\text{H-SFN} * 1024 + \text{SFN}) \text{ mod } 4096 = 0$. Figure 5.2.1.3-1: Change of system Information

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Claim	Grounds for Invalidity
	<i>SystemInformationBlockType1</i> (or <i>MasterInformationBlock-NB</i> in NB-IoT) includes a value tag <i>systemInfoValueTag</i>, that indicates if a change has occurred in the SI messages. UEs may use <i>systemInfoValueTag</i>, e.g. upon return from out of coverage, to verify if the previously stored SI messages are still valid. Additionally, for other than BL UEs or UEs in CE or NB-IoT UEs, the UE considers stored system information to be invalid after 3 hours from the moment it was successfully confirmed as valid, unless specified otherwise. BL UE or UE in CE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid, unless the UE is configured by parameter <i>si-ValidityTime</i> to consider stored system information to be invalid 3 hours after validity confirmation. NB-IoT UE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid. TS 36.331 at 5.2.1.3. 5.2.2.1 General <pre> sequenceDiagram participant UE participant EUTRAN as E-UTRAN EUTRAN->>UE: MasterInformationBlock EUTRAN->>UE: SystemInformationBlockType1 EUTRAN->>UE: SystemInformation </pre> Figure 5.2.2.1-1: System information acquisition, normal The UE applies the system information acquisition procedure to acquire the AS- and NAS- system information that is broadcasted by the E-UTRAN. The procedure applies to UEs in RRC_IDLE and UEs in RRC_CONNECTED. TS 36.331 at 5.2.2.1.

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Claim	Grounds for Invalidity
	– <i>SystemInformationBlockType1</i> <i>SystemInformationBlockType1</i> contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information. <i>SystemInformationBlockType1-BR</i> uses the same structure as <i>SystemInformationBlockType1</i>. Signalling radio bearer: N/A RLC-SAP: TM Logical channels: BCCH and BR-BCCH Direction: E-UTRAN to UE <i>SystemInformationBlockType1</i> message <pre>-- ASN1START SystemInformationBlockType1-BR-r13 ::= SystemInformationBlockType1 SystemInformationBlockType1 ::= SEQUENCE { cellAccessRelatedInfo SEQUENCE { plmn-IdentityList PLMN-IdentityList, trackingAreaCode TrackingAreaCode, cellIdentity CellIdentity, cellBarred ENUMERATED {barred, notBarred}, intraFreqReselection ENUMERATED {allowed, notAllowed}, csg-Indication BOOLEAN, csg-Identity CSG-Identity OPTIONAL -- Need OR }, cellSelectionInfo SEQUENCE { q-RxLevMin Q-RxLevMin, . . . } }</pre>

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Claim	Grounds for Invalidity
	<pre> SchedulingInfoList ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo SchedulingInfo ::= SEQUENCE { si-Periodicity ENUMERATED { rf8, rf16, rf32, rf64, rf128, rf256, rf512}, sib-MappingInfo SIB-MappingInfo } SchedulingInfoList-BR-r13 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-BR-r13 SchedulingInfo-BR-r13 ::= SEQUENCE { si-Narrowband-r13 INTEGER (1..maxAvailNarrowBands-r13), si-TBS-r13 ENUMERATED {b152, b208, b256, b328, b408, b504, b600, b712, b808, b936} } SIB-MappingInfo ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type SIB-Type ::= ENUMERATED { sibType3, sibType4, sibType5, sibType6, sibType7, sibType8, sibType9, sibType10, sibType11, sibType12-v920, sibType13-v920, sibType14-v1130, sibType15-v1130, sibType16-v1130, sibType17-v1250, sibType18-v1250, ..., sibType19-v1250, sibType20-v1310} SystemInfoValueTagList-r13 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SystemInfoValueTagSI-r13 SystemInfoValueTagSI-r13 ::= INTEGER (0..3) </pre> TS 36.331 at § 6.2.2. <i>sib-MappingInfo</i> List of the SIBs mapped to this <i>SystemInformation</i> message. There is no mapping information of SIB2; it is always present in the first <i>SystemInformation</i> message listed in the <i>schedulingInfoList</i> list. TS 36.331 at 297. <i>systemInfoValueTagList</i> Indicates SI message specific value tags for BL UEs and UE in CE. It includes the same number of entries, and listed in the same order, as in <i>SchedulingInfoList</i> (without suffix). <i>systemInfoValueTagSI</i> SI message specific value tag as specified in subclause 5.2.1.3. Common for all SIBs within the SI message other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. <i>systemInfoValueTag</i> Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message. TS 36.331 at 297.

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Claim	Grounds for Invalidity
	In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results. For example, to the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach a value tag being updated upon a change of a corresponding second type SIB, including U.S. Patent Publication No. 2015-0382284 (“Brismar”) and U.S. Patent Publication No.2019/0158988 (“Lee 988”), and 3GPP TSG-RAN WG2 Meeting #56 R2-063137 (Nortel) (“R2-063137”). A POSITA would have been motivated to supplement TS 36.331’s teaching identified above with other references that provide additional details related to strategies for distributing system information more efficiently, including Brismar, Lee 988 and R2-063137. Each of these references are 3GPP standards, and are closely related in the art. Further, a POSITA would be motivated by the teachings of these references to include a value tag being updated upon a change of a corresponding second type SIB. <i>See</i> Brismar at [0087], [0092], [0103]-[0108], [0173]; Lee 988 at [0020], [0071], [0168] and Figure 13; R2-063137 at Page 3, Section 4, Paragraph 1. <u>Network Initiated triggered</u> Network decides to change a parameter. The broadcast of the modified System Information blocks can start for a cycle that allows all UEs to get the information. Value Tag is updated, if some UEs miss the transmission they can ask for a new switch on. This means that value tags for SIBs in S-BCH would have to be broadcast all the time, but anyway it seems the current assumption that value tags are transmitted in the P-BCH. Also it is possible for the network to de-activate this mechanism when it detects that many UEs are requesting Sib transmission. This could allow to turn off this mechanism when it gets non effective and also to limit the RACH load at the same time. R2-063137 at Page 3, Section 4, Paragraph 1.

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Claim	Grounds for Invalidity
	To the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, including Brismar, Lee, 3GPP TSG-RAN WG2 Meeting #92, R2-163586 (Intel) (“R2-163586”), 3GPP TSG-RAN WG2 Meeting #56bis, R2-063585 (Nortel & NEC) (“R2-063585”), R2-063137, and R2-063137. A POSITA would appreciate that these references are directed toward SIB system design and could be combined with TS 36.331’s teaching related to SIB transmission information. A POSITA would have been motivated to supplement TS 36.331’s teaching identified above with other references that provide additional details related to strategies for distributing system information more efficiently, including Brismar, Lee and R2-163586’s teaching of broadcast and on-demand flags. Further, a POSITA would have recognized that a feature-rich wireless communication protocol, such as LTE-Advanced or NR at the time of 36.331, had many kinds of system information that may not be relevant or applicable to all UEs, and the relegating some system information to be on-demand rather than broadcast would free up system bandwidth to use on data, as contemplated by Brismar, Lee 988, R2-163586, R2-163371, and Interdigital. A POSITA would be motivated by the teachings of these references to provide system information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand. <i>See</i> Brismar at [0087], [0092], [0095], [0103-0109], Figures 5A-5C; Lee 988 at [0071], [0133]-[0135], [0168], Figure 13; R2-163586 at Pages 1-2, Section 2.2, Paragraphs 3-5; R2-063585 at Page 1, Section 2, SIB Grouping Subsection, Page 2, Section 2, UE Behavior Subsection; and R2-063137 at Page 1, Section 2, Paragraph 2, Page 3, Section 3, Paragraph 1-2 and Page 3, Section 4, Paragraph 1.

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Claim	Grounds for Invalidity
	<u>Summary</u> - On/Off groups of SIBs are regularly scheduled but may not be transmitted - Scheduling Information is always transmitted (possibility to switch them off too may be studied) - A gating bit transmitted alongside the scheduling information indicates whether the SIB is currently switched on or off - Candidates SIB may also be switched on in a periodical way by the network no matter if some UEs requested them or not in order to handle bad UL coverage and limit RACH load. R2-063137 at Page 4, Section 3 Summary.
[1.3] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;	TS 36.331 teaches upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast. Illustrative citations showing disclosures of this element are reproduced below.

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	5.2.1.3 System information validity and notification of changes Change of system information (other than for ETWS, CMAS and EAB parameters and other than for AB parameters for NB-IoT) only occurs at specific radio frames, i.e. the concept of a modification period is used. System information may be transmitted a number of times with the same content within a modification period, as defined by its scheduling. The modification period boundaries are defined by SFN values for which $\text{SFN mod } m = 0$, where m is the number of radio frames comprising the modification period. If H-SFN is provided in <i>SystemInformationBlockType1-BR</i>, modification period boundaries for BL UEs and UEs in CE are defined by SFN values for which $(\text{H-SFN} * 1024 + \text{SFN}) \text{ mod } m = 0$. For NB-IoT, H-SFN is always provided and the modification period boundaries are defined by SFN values for which $(\text{H-SFN} * 1024 + \text{SFN}) \text{ mod } m = 0$. The modification period is configured by system information. To enable system information update notification for RRC_IDLE UEs using an eDRX cycle longer than or equal to the modification period, an eDRX acquisition period is defined. The boundaries of the eDRX acquisition period are determined by H-SFN values for which $\text{H-SFN mod } 256 = 0$. For NB-IoT, the boundaries of the eDRX acquisition period are determined by H-SFN values for which $\text{H-SFN mod } 1024 = 0$. When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE using a DRX cycle that is smaller than or equal to the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC_IDLE using a DRX cycle that is longer than the modification period acquires the updated system information immediately from the start of the next eDRX acquisition period. The UE applies the previously acquired system information until the UE acquires the new system information. The possible boundaries of modification for <i>SystemInformationBlockType1-BR</i> are defined by SFN values for which $\text{SFN mod } 512 = 0$ except for notification of ETWS/CMAS for which the eNB may change <i>SystemInformationBlockType1-BR</i> content at any time. For NB-IoT, the possible boundaries of modification for <i>SystemInformationBlockType1-NB</i> are defined by SFN values for which $(\text{H-SFN} * 1024 + \text{SFN}) \text{ mod } 4096 = 0$. Figure 5.2.1.3-1: Change of system Information

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Claim	Grounds for Invalidity						
	3> the <i>MasterInformationBlock</i>, <i>SystemInformationBlockType1-BR</i> and <i>SystemInformationBlockType2</i>; NOTE: E-UTRAN may release BL UEs or UEs in CE or NB-IoT UEs to RRC_IDLE if these UEs need to acquire changed system information. 1> delete any stored system information after 3 hours or 24 hours from the moment it was confirmed to be valid as defined in 5.2.1.3, unless specified otherwise; 1> consider any stored system information except <i>SystemInformationBlockType10</i>, <i>SystemInformationBlockType11</i>, <i>systemInformationBlockType12</i> and <i>systemInformationBlockType14</i> (<i>systemInformationBlockType14-NB</i> in NB-IoT) to be invalid if <i>systemInfoValueTag</i> included in the <i>SystemInformationBlockType1</i> (<i>MasterInformationBlock-NB</i> in NB-IoT) is different from the one of the stored system information and in case of NB-IoT UEs, BL UEs and UEs in CE, <i>systemInfoValueTagSI</i> is not broadcasted. Otherwise consider system information validity as defined in 5.2.1.3; TS 36.331 at 5.2.2.3. <pre>SchedulingInfo ::= SEQUENCE { si-Periodicity ENUMERATED { rf8, rf16, rf32, rf64, rf128, rf256, rf512}, sib-MappingInfo SIB-MappingInfo }</pre> TS 36.331 at 294. <table><tr><td>systemInfoValueTagList</td></tr><tr><td>Indicates SI message specific value tags for BL UEs and UE in CE. It includes the same number of entries, and listed in the same order, as in <i>SchedulingInfoList</i> (without suffix).</td></tr><tr><td>systemInfoValueTagSI</td></tr><tr><td>SI message specific value tag as specified in subclause 5.2.1.3. Common for all SIBs within the SI message other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14.</td></tr><tr><td>systemInfoValueTag</td></tr><tr><td>Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message.</td></tr></table> TS 36.331 at 297.	systemInfoValueTagList	Indicates SI message specific value tags for BL UEs and UE in CE. It includes the same number of entries, and listed in the same order, as in <i>SchedulingInfoList</i> (without suffix).	systemInfoValueTagSI	SI message specific value tag as specified in subclause 5.2.1.3. Common for all SIBs within the SI message other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14.	systemInfoValueTag	Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message.
systemInfoValueTagList							
Indicates SI message specific value tags for BL UEs and UE in CE. It includes the same number of entries, and listed in the same order, as in <i>SchedulingInfoList</i> (without suffix).							
systemInfoValueTagSI							
SI message specific value tag as specified in subclause 5.2.1.3. Common for all SIBs within the SI message other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14.							
systemInfoValueTag							
Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message.							

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Claim	Grounds for Invalidity
	In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results. For example, to the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach non-broadcast system information scheduled for broadcast after the UE makes a request, including R2-163568, R2-063585, R2-163371 (May 2016 RAN2 Meeting) (Samsung) (“R2-163371”), and Report of email discussion on [94#40][NR] System Information (“Interdigital”). A POSITA would appreciate that a 3GPP RAN2 meeting, such as RAN WG2 Meeting No. 94, and email discussion following RAN WG2 Meeting No. 95, includes presentations and discussions by interested members of the public and results in agreements for how wireless standards are to be specified and would be motivated to combine that disclosure with other teachings in the field, as well as his background knowledge. A POSITA would have been motivated to supplement TS 36.331’s teaching identified above with other references that provide additional details related to strategies for distributing system information more efficiently, including R2-163568, R2-163371, and InterDigital. Each of these references relates to system information signaling design in 3GPP standards, and are closely related in the art. Additionally, a POSITA would have recognized that a system that allowed some of its system information blocks to change from on-demand to broadcast would need to update the system information block that provided scheduling information for other system information blocks, so that UEs could receive the changed system information block. Further, a POSITA would be motivated by the teachings of these references to provide system information via broadcast after UE request in order to increase efficiency. <i>See</i> R2-163568 at Page 3, Section 2.3, Paragraphs 4 and 7, Figure 3; R2-063585 at Pages 3-4, Section 4, Paragraph 9; R2-136671 at Section 2.2 Broadcast Signaling for Essential System Information; TS 36.300 at 7.7; InterDigital at Question 2b and Question 4b.

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Claim	Grounds for Invalidity
	<u>Interdigital</u> <u>We think that the NW should have means to configure what information to include in the broadcasted System Information at any time, and that it will also be possible to use dedicated signaling to provide at least some system information to a UE. Given this, whether system information following an on-demand request will be added to the broadcasted system information, and/or provisioned in a unicast manner should simply be up to NW implementation.</u> InterDigital at Question 4b. - When system information update is required, if all UEs send a request to get the updated system information, there might be network congestion issue. However whether simultaneous update from all UEs is required or not might dependent on the characteristics of related system information. For example, cell reselection information is mainly used for load balancing, and it might be OK for UE to use old system information for a while before using the new information. For some system information (e.g. MBMS related system information), it might be desirable for UE to always use the most up-to-date system information to avoid configuration mismatch. From the above discussion, it might be necessary that for the update of non-essential system information, a broadcast mechanism is used to minimize UE power consumption and to avoid network congestion. In Figure 3 below, the transmission mechanisms for system information are illustrated. Essential system information is broadcasted in NR, just as in LTE. Non-essential system information is only broadcasted for system information update, and is provisioned in on-demand manner in other cases. Legends ■ Essential SIB ■ Non-essential SIB / Broadcast ■ Non-essential SIB / On-demand The diagram illustrates the transmission of system information in LTE and NR. In LTE, a 'Modification period' is shown where Essential SIBs (red) and Non-essential SIBs (yellow) are broadcasted. In NR, Essential SIBs (red) are broadcasted, while Non-essential SIBs are handled via 'SI update' (yellow) and 'On-demand provisioning' (green). Figure 3: System information transmission and update in NR

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Claim	Grounds for Invalidity
	R2-163586 at Section 2.3 System Information Update.
[1.4] transmitter circuitry configured to:	TS 36.331 teaches transmitter circuitry. Illustrative citations showing disclosures of this element are reproduced below. 5.2.1.2a Scheduling for NB-IoT The <i>MasterInformationBlock-NB</i> (MIB-NB) uses a fixed schedule with a periodicity of 640 ms and repetitions made within 640 ms. The first transmission of the MIB-NB is scheduled in subframe #0 of radio frames for which the SFN mod 64 = 0 and repetitions are scheduled in subframe #0 of all other radio frames. The transmissions are arranged in 8 independently decodable blocks of 80 ms duration. The <i>SystemInformationBlockType1-NB</i> (SIB1-NB) uses a fixed schedule with a periodicity of 2560 ms. SIB1-NB transmission occurs in subframe #4 of every other frame in 16 continuous frames. The starting frame for the first transmission of the SIB1-NB is derived from the cell PCID and the number of repetitions within the 2560 ms period and repetitions are made, equally spaced, within the 2560 ms period (see TS 36.213 [23]). TBS for <i>SystemInformationBlockType1-NB</i> and the repetitions made within the 2560 ms are indicated by <i>schedulingInfoSIB1</i> field in the MIB-NB. The SI messages are transmitted within periodically occurring time domain windows (referred to as SI-windows) using scheduling information provided in <i>SystemInformationBlockType1-NB</i>. Each SI message is associated with a SI- window and the SI-windows of different SI messages do not overlap. That is, within one SI-window only the corresponding SI is transmitted. The length of the SI-window is common for all SI messages, and is configurable. Within the SI-window, the corresponding SI message can be transmitted a number of times over 2 or 8 consecutive NB-IoT downlink subframes depending on TBS. The UE acquires the detailed time/frequency domain scheduling information and other information, e.g. used transport format for the SI messages from <i>schedulingInfoList</i> field in <i>SystemInformationBlockType1-NB</i>. The UE is not required to accumulate several SI messages in parallel but may need to accumulate a SI message across multiple SI windows, depending on coverage condition. <i>SystemInformationBlockType1-NB</i> configures the SI-window length and the transmission periodicity for all SI messages. TS 36.331 at 5.2.1.2a.

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Claim	Grounds for Invalidity
	In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results. For example, to the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach transmitting circuitry, including Lee 988. A POSITA would appreciate that TS 36.331 teaches “transmitting” and would therefore require circuitry for performing the transmissions. A POSITA would have been motivated to supplement TS 36.331’s teaching identified above with other references that provide additional details related to circuitry to execute the disclosed transmission, including Lee 988 and Bendlin. Further, a POSITA would be motivated by the teachings of these references to circuitry for performing the transmission disclosed by the standard because both references relate to essential system information transmission in a wireless network. <i>See</i> Lee 988 at [0183]-[0185] and Figure 15.

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Claim	Grounds for Invalidity
	<pre> graph LR subgraph 1500 [1500] 1501[processor] --- 1503[transceiver] 1501 --- 1502[memory] end subgraph 1510 [1510] 1513[transceiver] --- 1511[processor] 1513 --- 1512[memory] end 1503 --- Ant1[Antenna] Ant1 --- Ant2[Antenna] --- 1513 </pre> Lee 988 at Figure 15.
[1.5] transmit the first type SIB;	TS 36.331 teaches transmitting the first type SIB. Illustrative citations showing disclosures of this element are reproduced below.

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Claim	Grounds for Invalidity
	5.2.1.1 General System information is divided into the <i>MasterInformationBlock</i> (MIB) and a number of <i>SystemInformationBlocks</i> (SIBs). The MIB includes a limited number of most essential and most frequently transmitted parameters that are needed to acquire other information from the cell, and is transmitted on BCH. SIBs other than <i>SystemInformationBlockType1</i> are carried in <i>SystemInformation</i> (SI) messages and mapping of SIBs to SI messages is flexibly configurable by <i>schedulingInfoList</i> included in <i>SystemInformationBlockType1</i>, with restrictions that: each SIB is contained only in a single SI message, and at most once in that message; only SIBs having the same scheduling requirement (periodicity) can be mapped to the same SI message; <i>SystemInformationBlockType2</i> is always mapped to the SI message that corresponds to the first entry in the list of SI messages in <i>schedulingInfoList</i>. There may be multiple SI messages transmitted with the same periodicity. <i>SystemInformationBlockType1</i> and all SI messages are transmitted on DL-SCH. TS 36.331 at 5.2.1.1. In addition to broadcasting, E-UTRAN may provide <i>SystemInformationBlockType1</i>, including the same parameter values, via dedicated signalling i.e., within an <i>RRCConnectionReconfiguration</i> message. <i>Id.</i> <i>SystemInformationBlockType1</i> configures the SI-window length and the transmission periodicity for the SI messages. TS 36.331 at 5.2.1.2. Within the SI-window, the corresponding SI message can be transmitted a number of times over 2 or 8 consecutive NB-IoT downlink subframes depending on TBS. The UE acquires the detailed time/frequency domain scheduling information and other information, e.g. used transport format for the SI messages from <i>schedulingInfoList</i> field in <i>SystemInformationBlockType1-NB</i>. The UE is not required to accumulate several SI messages in parallel but may need to accumulate a SI message across multiple SI windows, depending on coverage condition. <i>SystemInformationBlockType1-NB</i> configures the SI-window length and the transmission periodicity for all SI messages. TS 36.331 at 5.2.1.2a.

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Claim	Grounds for Invalidity
	5.2.2.1 General <pre>sequenceDiagram participant UE participant E-UTRAN E-UTRAN->>UE: MasterInformationBlock E-UTRAN->>UE: SystemInformationBlockType1 E-UTRAN->>UE: SystemInformation</pre> Figure 5.2.2.1-1: System information acquisition, normal The UE applies the system information acquisition procedure to acquire the AS- and NAS- system information that is broadcasted by the E-UTRAN. The procedure applies to UEs in RRC_IDLE and UEs in RRC_CONNECTED. For BL UE, UE in CE and NB-IoT UE, specific conditions apply, as specified below. TS 36.331 at 5.2.2.1.

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Claim	Grounds for Invalidity
	5.3.2 Paging 5.3.2.1 General  Figure 5.3.2.1-1: Paging The purpose of this procedure is: - to transmit paging information to a UE in RRC_IDLE and/ or; - to inform UEs in RRC_IDLE and UEs other than NB-IoT UEs in RRC_CONNECTED about a system information change and/ or; - to inform UEs other than NB-IoT UEs about an ETWS primary notification and/ or ETWS secondary notification and/ or; - to inform UEs other than NB-IoT UEs about a CMAS notification and/ or; - to inform UEs other than NB-IoT UEs in RRC_IDLE about an EAB parameters modification and/ or; - to inform UEs other than NB-IoT UEs in RRC_IDLE to perform E-UTRAN inter-frequency redistribution procedure. The paging information is provided to upper layers, which in response may initiate RRC connection establishment, e.g. to receive an incoming call. TS 36.331 at 5.3.2.1.

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Claim	Grounds for Invalidity
	5.3.2.3 Reception of the <i>Paging</i> message by the UE Upon receiving the <i>Paging</i> message, the UE shall: 1> if in RRC_IDLE, for each of the <i>PagingRecord</i>, if any, included in the <i>Paging</i> message: 2> if the <i>ue-Identity</i> included in the <i>PagingRecord</i> matches one of the UE identities allocated by upper layers: 3> forward the <i>ue-Identity</i> and, except for NB-IoT, the <i>cn-Domain</i> to the upper layers; 1> if the <i>systemInfoModification</i> is included; or 1> if the UE is configured with a DRX cycle longer than the modification period and the <i>systemInfoModification-eDRX</i> is included: 2> re-acquire the required system information using the system information acquisition procedure as specified in 5.2.2. 1> if the <i>etws-Indication</i> is included and the UE is ETWS capable: 2> re-acquire <i>SystemInformationBlockType1</i> immediately, i.e., without waiting until the next system information modification period boundary; TS 36.331 at 5.3.2.3. In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
[1.6] transmit a message that triggers the wireless terminal to receive the first type SIB, wherein;	TS 36.331 teaches transmitting a message that triggers the wireless terminal to receive the first type SIB. Illustrative citations showing disclosures of this element are reproduced below.

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Claim	Grounds for Invalidity
	When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE using a DRX cycle that is smaller than or equal to the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC_IDLE using a DRX cycle that is longer than the modification period acquires the updated system information immediately from the start of the next eDRX acquisition period. The UE applies the previously acquired system information until the UE acquires the new system information. The possible boundaries of modification for <i>SystemInformationBlockType1-BR</i> are defined by SFN values for which $\text{SFN mod } 512 = 0$ except for notification of ETWS/CMAS for which the eNB may change <i>SystemInformationBlockType1-BR</i> content at any time. For NB-IoT, the possible boundaries of modification for <i>SystemInformationBlockType1-NB</i> are defined by SFN values for which $(\text{H-SFN} * 1024 + \text{SFN}) \text{ mod } 4096 = 0$. Figure 5.2.1.3-1: Change of system Information The <i>Paging</i> message is used to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about a system information change. If the UE is in RRC_CONNECTED or uses a DRX cycle shorter than or equal to the modification period, and receives a <i>Paging</i> message including the <i>systemInfoModification</i>, it knows that the system information will change at the next modification period boundary. If a UE in RRC_IDLE uses a DRX cycle longer than the modification period, and the notification is received in a <i>Paging</i> message including the <i>systemInfoModification-eDRX</i>, it acquires the updated system information at the next eDRX acquisition period boundary. Although the UE may be informed about changes in system information, no further details are provided e.g. regarding which system information will change, except if <i>systemInfoSIValueTag</i> is received by BL UEs or UEs in CE. TS 36.331 at 5.2.1.3.

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	— SystemInformation The <i>SystemInformation</i> message is used to convey one or more System Information Blocks. All the SIBs included are transmitted with the same periodicity. <i>SystemInformation-BR</i> uses the same structure as <i>SystemInformation</i>. Signalling radio bearer: N/A RLC-SAP: TM Logical channels: BCCH and BR-BCCH Direction: E-UTRAN to UE TS 36.331 at 289. — SystemInformationBlockType1 <i>SystemInformationBlockType1</i> contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information. <i>SystemInformationBlockType1-BR</i> uses the same structure as <i>SystemInformationBlockType1</i>. Signalling radio bearer: N/A RLC-SAP: TM Logical channels: BCCH and BR-BCCH Direction: E-UTRAN to UE TS 36.331 at 290. In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each

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Claim	Grounds for Invalidity
	of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
[1.7] whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.	TS 36.331 teaches that whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB. Illustrative citations showing disclosures of this element are reproduced below. 5.2.2.3 System information required by the UE The UE shall: 1> ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information: 2> if in RRC_IDLE: 3> if the UE is a NB-IoT UE: 4> the <i>MasterInformationBlock-NB</i> and <i>SystemInformationBlockType1-NB</i> as well as <i>SystemInformationBlockType2-NB</i> through <i>SystemInformationBlockType5-NB</i>; 3> else: 4> the <i>MasterInformationBlock</i> and <i>SystemInformationBlockType1</i> (or <i>SystemInformationBlockType1-BR</i> depending on whether the UE is a BL UE or the UE in CE) as well as <i>SystemInformationBlockType2</i> through <i>SystemInformationBlockType8</i> (depending on support of the concerned RATs), <i>SystemInformationBlockType17</i> (depending on support of RAN-assisted WLAN interworking); . . .

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	1> delete any stored system information after 3 hours or 24 hours from the moment it was confirmed to be valid as defined in 5.2.1.3, unless specified otherwise; 1> consider any stored system information except <i>SystemInformationBlockType10</i>, <i>SystemInformationBlockType11</i>, <i>systemInformationBlockType12</i> and <i>systemInformationBlockType14</i> (<i>systemInformationBlockType14-NB</i> in NB-IoT) to be invalid if <i>systemInfoValueTag</i> included in the <i>SystemInformationBlockType1</i> (<i>MasterInformationBlock-NB</i> in NB-IoT) is different from the one of the stored system information and in case of NB-IoT UEs, BL UEs and UEs in CE, <i>systemInfoValueTagSI</i> is not broadcasted. Otherwise consider system information validity as defined in 5.2.1.3; TS 36.331 at 5.2.2.3. <i>SystemInformationBlockType1</i> (or <i>MasterInformationBlock-NB</i> in NB-IoT) includes a value tag <i>systemInfoValueTag</i>, that indicates if a change has occurred in the SI messages. UEs may use <i>systemInfoValueTag</i>, e.g. upon return from out of coverage, to verify if the previously stored SI messages are still valid. Additionally, for other than BL UEs or UEs in CE or NB-IoT UEs, the UE considers stored system information to be invalid after 3 hours from the moment it was successfully confirmed as valid, unless specified otherwise. BL UE or UE in CE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid, unless the UE is configured by parameter <i>si-ValidityTime</i> to consider stored system information to be invalid 3 hours after validity confirmation. NB-IoT UE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid. For BL UEs or UEs in CE or NB-IoT UEs, the change of specific SI message can additionally be indicated by a SI message specific value tag <i>systemInfoValueTagSI</i>. If <i>systemInfoValueTag</i> included in the <i>SystemInformationBlockType1-BR</i> (or <i>MasterInformationBlock-NB</i> in NB-IoT) is different from the one of the stored system information and if <i>systemInfoValueTagSI</i> is included in the <i>SystemInformationBlockType1-BR</i> (or <i>SystemInformationBlockType1-NB</i> in NB-IoT) for a specific SI message and is different from the stored one, the UE shall consider this specific SI message to be invalid. If only <i>systemInfoValueTag</i> is included and is different from the stored one, the BL UE or UE in CE should consider any stored system information except <i>SystemInformationBlockType10</i>, <i>SystemInformationBlockType11</i>, <i>SystemInformationBlockType12</i> and <i>SystemInformationBlockType14</i> to be invalid; the NB-IoT UE should consider any stored system information except <i>SystemInformationBlockType14-NB</i> to be invalid. TS 36.331 at 5.2.1.3. In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of

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Claim	Grounds for Invalidity
	ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results.
2. The access node of claim 1, wherein the transmitter circuitry is further configured to transmit the second type SIB by broadcast after the change.	TS 36.331 teaches transmitter circuitry further configured to transmit the second type SIB by broadcast after the change. Illustrative citations showing disclosures of this element are reproduced below.

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Claim	Grounds for Invalidity
	5.2.2.9 Actions upon reception of <i>SystemInformationBlockType2</i> Upon receiving <i>SystemInformationBlockType2</i>, the UE shall: 1> apply the configuration included in the <i>radioResourceConfigCommon</i>; 1> if upper layers indicate that a (UE specific) paging cycle is configured: 2> apply the shortest of the (UE specific) paging cycle and the <i>defaultPagingCycle</i> included in the <i>radioResourceConfigCommon</i>; 1> if the <i>mbfn-SubframeConfigList</i> is included: 2> consider that DL assignments may occur in the MBSFN subframes indicated in the <i>mbfn-SubframeConfigList</i> under the conditions specified in [23, 7.1]; 1> apply the specified PCCH configuration defined in 9.1.1.3; 1> not apply the <i>timeAlignmentTimerCommon</i>; 1> if in RRC_CONNECTED and UE is configured with RLF timers and constants values received within <i>rlf-TimersAndConstants</i>: 2> not update its values of the timers and constants in <i>ue-TimersAndConstants</i> except for the value of timer T300; 1> if in RRC_CONNECTED while T311 is not running; and the UE supports multi-band cells as defined by bit 31 in <i>featureGroupIndicators</i> or <i>multipleNS-Pmax</i>: 2> disregard the <i>additionalSpectrumEmission</i> and <i>ul-CarrierFreq</i>, if received, while in RRC_CONNECTED; 1> forward <i>attachWithoutPDN-Connectivity</i> to upper layers, if received for the selected PLMN; 1> forward <i>cp-CIoT-EPS-Optimisation</i> to upper layers, if received for the selected PLMN; 1> forward <i>up-CIoT-EPS-Optimisation</i> to upper layers, if received for the selected PLMN: Upon receiving <i>SystemInformationBlockType2-NB</i>, the UE shall: 1> apply the configuration included in the <i>radioResourceConfigCommon</i>; 1> apply the <i>defaultPagingCycle</i> included in the <i>radioResourceConfigCommon</i>; 1> apply the specified PCCH configuration defined in 9.1.1.3.

EXHIBIT C-4 to Defendants' Invalidity Contentions

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Claim	Grounds for Invalidity
	TS 36.331 at 5.2.2.9. See also TS 36.331 at 5.2.2.10-5.2.2.27. In addition, to the extent it is found that TS 36.331 does not expressly disclose this limitation, the limitation is inherent. Moreover, to the extent it is found that TS 36.331 does not anticipate this claim, TS 36.331 renders it obvious, either alone, in combination with the knowledge of a person of ordinary skill in the art, and/or in combination with other prior art references identified in the cover pleading or herein. A person of ordinary skill in the art would have been motivated to combine TS 36.331 with any of the other prior art references identified in the cover pleading or herein with a reasonable expectation of success because each of these references contains familiar elements within the same field of endeavor to address the same known problems, according to known methods which would yield predictable results. For example, to the extent that TS 36.331 does not disclose this claim limitation, it would have been obvious for a POSITA to combine TS 36.331 with other references that teach non-broadcast system information scheduled for broadcast after the UE makes a request, including R2-163536, InterDigital, and R2-163586. A POSITA would appreciate that a 3GPP RAN2 meeting, such as RAN WG2 Meeting No. 94, and email discussion following RAN 2G2 Meeting No. 95, includes presentations and discussions by interested members of the public and results in agreements for how wireless standards are to be specified and would be motivated to combine that disclosure with other teachings in the field, as well as his background knowledge. A POSITA would have been motivated to supplement TS 36.331's teaching identified above with other references that provide additional details related to strategies for transmitting the second type SIB by broadcast after the change, including R2-16353, InterDigital, and R2-163586. Each of these references relates to system information signaling design in 3GPP standards, and are closely related in the art. Further, a POSITA would be motivated by the teachings of these references to provide system information via broadcast after UE request in order to increase efficiency. <i>See</i> R2-136536 at 2.2 Broadcast Signaling for Essential System Information; InterDigital at Questions 3a and 4b; R2-163586 at Page 3, Section 2.3, Paragraph 7.

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Claim	Grounds for Invalidity
	In Figure 3 below, the transmission mechanisms for system information are illustrated. Essential system information is broadcasted in NR, just as in LTE. Non-essential system information is only broadcasted for system information update, and is provisioned in on-demand manner in other cases. Figure 3: System information transmission and update in NR R2-163586 at Page 3, Section 2.3, Paragraph 7.
3. [Pre] A method for an access node of a radio access network that communicates over a radio interface with a wireless terminal, the method comprising:	TS 36.331 teaches a method for an access node of a radio access network that communicates over a radio interface with a wireless terminal. The discussion of claim element 1[pre] is incorporated herein by reference.
[3.1] generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more	TS 36.331 teaches generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network. The discussion of claim element [1.2] is incorporated herein by reference.

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Claim	Grounds for Invalidity
associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;	
[3.2] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, including in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;	TS 36.331 teaches upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, including in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast. The discussion of claim element [1.3] is incorporated herein by reference.
[3.3] transmitting the first type SIB;	TS 36.331 teaches transmitting the first type SIB.

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Claim	Grounds for Invalidity
	The discussion of claim element [1.5] is incorporated herein by reference.
[3.4] transmitting a message that triggers the wireless terminal to receive the first type SIB,	TS 36.331 teaches transmitting a message that triggers the wireless terminal to receive the first type SIB. The discussion of claim element [1.6] is incorporated herein by reference.
[3.5] wherein; whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.	TS 36.331 teaches that whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB. The discussion of claim element [1.7] is incorporated herein by reference.
4. The method of claim 3, further comprising transmitting the second type SIB by broadcast after the change.	TS 36.331 teaches transmitting the second type SIB by broadcast after the change. The discussion of claim element [2] is incorporated herein by reference.