~~**WHAT IS CLAIMED IS:**~~

CLAIMS

1. A method of wireless communication, comprising:

communicating, by a first wireless communication device with a second wireless communication device, mode information for determining ~~whether to perform a listen-before-talk (LBT) mode for a random access procedure; and~~

a listen-before-talk (LBT) mode for a random access procedure, wherein the communicating the mode information includes communicating a group-common physical downlink control channel (PDCCH) indicating a start and a duration of a transmission opportunity (TXOP); determining, by the first wireless communications device based at least on the start and the duration of the TXOP, whether to transmit a random access message within the TXOP; and communicating, by the first wireless communication device with the second wireless communication device, ~~a~~the random access message based on the mode information in response to the determining.

2. The method of claim 1, wherein the LBT mode is a category 4 LBT mode, a category 2 LBT mode, or a no LBT mode.

3. The method of claim 1, wherein the first wireless communication device is a ~~base station (BS~~user equipment (UE), and the second wireless communication device is a ~~user equipment (UE~~base station (BS).

4. The method of claim 3, wherein communicating the mode information includes ~~transmitting~~receiving, by the ~~BS, a~~UE, the group-common PDCCH ~~to~~from the ~~UE~~BS.

5. The method of claim 3, wherein communicating the mode information includes ~~transmitting~~receiving, by the ~~BS~~UE, a random access response (RAR) message that carries an uplink (UL) grant ~~to~~from the ~~UE~~BS, the UL grant indicating the ~~LBT~~ mode information.

6. The method of claim 5, wherein the UL grant indicates a channel access priority class for transmission of the RAR.

7. The method of claim 3, wherein communicating the mode information includes ~~transmitting:~~ receiving, by the ~~BS~~UE, a downlink (DL) grant indicating scheduling information for a second random access message; and transmission, by the UE, of the second random access message in accordance with the DL grant.

8. The method of claim 3, further comprising:

~~receiving~~ transmitting, by the ~~BS~~UE, a ~~first set of~~ random access channel (RACH) preamble, wherein the RACH preamble is one of a set of RACH preambles from a ~~first~~ set of UEs ~~and a second set of RACH preambles from a second set of UEs~~including the UE, wherein communicating the mode information includes communicating a first LBT mode for the ~~first~~ set of RACH preambles ~~and communicating~~that is different from a second LBT mode for ~~the~~a second set of RACH preambles.

9. The method of claim 3, wherein communicating the random access message includes ~~receiving~~transmitting, by the ~~BS~~UE, the random access message, and wherein the random access message includes at least one of a random access preamble, a connection request, or an acknowledgement for a connection response.

10. The method of claim 3, wherein communicating the random access message includes ~~transmitting~~receiving, by the ~~BS~~UE, the random access message, and wherein the random access message includes at least one of a random access response or a connection response.

11. The method of claim ~~1, wherein the first wireless communication device is a UE, and the second wireless communication device is a BS.~~

~~12. The method of claim 11~~3, wherein communicating the mode information includes receiving, by the UE, ~~a~~the group-common PDCCH indicating ~~a~~the start and ~~a~~the duration of ~~a transmission opportunity (~~the TXOP~~), the method further comprising:~~

~~determining, based on the start,~~ and the ~~duration of the TXOP, whether to transmit~~random access message comprises a set of random access messages ~~within the TXOP, the set of random access messages including at least the random access message;~~

, the method further comprising: in response to a determination to transmit the set of random access messages within the TXOP, performing a category 2 LBT mode for the random access procedure; and

in response to a determination to not transmit the set of random access messages within the TXOP, performing a category 4 LBT mode for the random access procedure.

~~13~~12. The method of claim ~~12~~11, wherein the UE determines to transmit the set of random access messages within the ~~first~~ TXOP, the method further comprising:

transmitting, by the UE, a subset of the set of random access messages in a second TXOP using the mode information determined from the group-common PDCCH if the UE does not transmit the subset within the ~~first~~ TXOP, the second TXOP being subsequent to the ~~first~~ TXOP.

~~14~~13. The method of claim ~~11~~3, wherein communicating the mode information includes receiving, by the UE, another random access message that carries an uplink (UL) grant for the random access message, and wherein communicating the random access message includes in response to a determination that the UL grant indicates a no LBT mode, transmitting, by the UE, the random access message on a channel without medium sensing, the method further comprising:

in response to a determination that the UL grant indicates a category 2 LBT mode, performing, by the UE, a category 2 LBT before transmitting the random access message; and

in response to a determination that the UL grant indicates a category 4 LBT mode, performing, by the UE, a category 4 LBT before transmitting the random access message.

~~15~~14. The method of claim ~~11~~3, wherein communicating the mode information includes receiving, by the UE, a downlink (DL) grant used for scheduling the random access message, wherein the random access message is ~~an~~ a random access response (RAR) or an acknowledgement for a connection response.

~~16~~15. The method of claim ~~15~~14, wherein the DL grant indicates the LBT mode, and wherein communicating the random access message includes in response to a determination that the DL grant indicates a no LBT mode, transmitting, by the UE, the random access message on a channel without medium sensing, the method further comprising:

in response to a determination that the DL grant indicates a category 2 LBT mode, performing, by the UE, a category 2 LBT before transmitting the random access message; and

in response to a determination that the DL grant indicates a category 4 LBT mode, performing, by the UE, a category 4 LBT before transmitting the random access message.

~~17~~16. The method of claim ~~15~~14, wherein the DL grant indicates an end of a second TXOP relative to transmission of the random access message, the method further comprising:

receiving an indication that a medium is available to the UE for a time period;

determining, based on the time period and the end of the second TXOP, whether to transmit the random access message within the second TXOP;

in response to a determination to transmit the random access message within the second TXOP, performing a category 2 LBT mode for the random access procedure; and

in response to a determination to not transmit the random access message within the second TXOP, performing a category 4 LBT mode for the random access procedure.

~~18~~17. An apparatus comprising:

~~means for communicating~~ a transceiver configured to: communicate, by a first wireless communication device with a second wireless communication device, mode information for determining ~~whether to perform an~~ a listen-before-talk (LBT) mode for a random access procedure~~;~~, wherein the transceiver is further configured to communicate the mode information by communicating a group-common physical downlink control channel (PDCCH) indicating a start and

~~means for communicating~~ a duration of a transmission opportunity (TXOP); and a processor configured to: determine, based at least on the start and the duration of the TXOP, whether to transmit a random access message within the TXOP; and the transceiver further configured to communicate, by the first wireless communication device with the second wireless

communication device, ~~a~~the random access message based on the mode information in response to the determination.

~~19~~18. The apparatus of claim ~~18~~17, wherein the LBT mode is a category 4 LBT mode, a category 2 LBT mode, or a no LBT mode.

~~20~~19. The apparatus of claim ~~18~~17, wherein the mode information is communicated via at least one of ~~a~~the group-common PDCCH, an uplink (UL) grant in a downlink (DL) message, or a DL grant for the DL message.

~~21~~20. The apparatus of claim ~~20~~19, wherein the UL grant indicates a channel access priority class for transmission of the random access message.

~~22~~21. The apparatus of claim ~~18~~17, wherein the random access message includes at least one of a random access preamble, ~~an~~ a random access response (RAR~~,~~), a connection request, a connection response, or an acknowledgement for the connection response.

~~23~~22. The apparatus of claim ~~18~~17, wherein the ~~means for communicating~~transceiver is further configured to communicate the mode information ~~includes means for~~by receiving ~~a~~the group-common PDCCH that indicates ~~a start and a duration of a transmission opportunity (TXOP), the apparatus further comprising:~~

~~means for determining, based on~~ the start and the duration of the TXOP, ~~whether to transmit~~and the random access message comprises a set of random access messages ~~within the TXOP~~, the ~~set of random access messages including at least the random access message;~~

~~means for performing a category 2 LBT mode for the random access procedure~~apparatus further comprising a processor configured to: in response to a determination to transmit the set of random access messages within the TXOP~~; and means for performing~~, perform a category ~~4~~2 LBT mode for the random access procedure; and in response to a determination to not transmit the set of random access messages within the TXOP, perform a category 4 LBT mode for the random access procedure.

~~24~~23. The apparatus of claim ~~18~~17, wherein the ~~means for communicating~~transceiver is further configured to communicate the mode information ~~includes means for~~by: receiving another random access message that carries an uplink (UL) grant for the random access message, the UL grant indicating the LBT mode.

~~25~~24. The apparatus of claim ~~24~~,23, wherein the transceiver is further ~~comprising:~~

~~means for transmitting~~configured to transmit the random access message on a channel without medium sensing in response to a determination that the UL grant indicates a no LBT mode~~;~~, the apparatus further comprising a processor configured to: in response to a determination that the UL grant indicates a category 2 LBT mode, perform a category 2 LBT before transmission of the random access message; and in response to a determination that the UL grant indicates a category 4 LBT mode, perform a category 4 LBT before transmission of the random access message wherein.

~~means for performing a category 2 LBT before transmission of the random access message in response to a determination that the UL grant indicates a category 2 LBT mode; and~~

~~means for performing a category 4 LBT before transmission of the random access message in response to a determination that the UL grant indicates a category 4 LBT mode.~~

~~26~~25. The apparatus of claim ~~18~~17, wherein the ~~means for communicating~~transceiver is further configured to communicate the mode information ~~includes means for~~by: receiving a downlink (DL) grant used for scheduling the random access message, the random access message being ~~an~~ a random access response (RAR) or an acknowledgement for a connection response.

~~27~~26. The apparatus of claim ~~26~~25, wherein the ~~means for communicating~~DL grant indicates the LBT mode, and wherein the transceiver is further configured to communicate the random access message ~~includes means for~~by transmitting the random access message on a channel without medium sensing, the apparatus further comprising~~:~~ a processor configured to: in response to a determination that the DL grant indicates a category 2 LBT mode, perform a category 2 LBT before transmission of the random access message; and in response to a determination that the DL grant indicates a category 4 LBT mode, perform a category 4 LBT before transmission of the random access message.

~~means for performing a category 2 LBT before transmission of the random access message in response to a determination that the DL grant indicates a category 2 LBT mode, wherein the DL grant indicates the LBT mode; and~~

~~means for performing a category 4 LBT before transmission of the random access message in response to a determination that the DL grant indicates a category 4 LBT mode.~~

~~28~~27. The apparatus of claim ~~26, further comprising:~~

~~means for receiving an indication that a medium is available to the UE for a time period,~~ 25, wherein the DL grant indicates an end of a second TXOP relative to transmission of the random access message~~;~~

~~means for determining~~, and wherein the transceiver is further configured to receive an indication that a medium is available to the apparatus for a time period, the apparatus further comprising a processor configured to: determine, based on the time period and the end of the second TXOP, whether to transmit the random access message within the second TXOP;

~~means for performing a category 2 LBT mode for the random access procedure~~ in response to a determination to transmit the random access message within the second TXOP~~; and~~

~~means for performing~~, perform a category ~~4~~2 LBT mode for the random access procedure; and in response to a determination to not transmit the random access message within the ~~TXOP~~second TXOP, performs a category 4 LBT mode for the random access procedure.

~~29. A~~28. A non-transitory computer-readable medium having program code recorded thereon, the program code comprising:

code for causing a first wireless communication device to communicate with a second wireless communication device, mode information for determining ~~whether to perform a~~ a listen-before-talk (LBT) mode for a random access procedure~~; and~~

, wherein the code for causing the first wireless communication device to communicate the mode information is further configured to cause the first wireless communication device to communicate, with the second wireless communication device, ~~a random access message based on the mode information~~the mode information by communicating a group-common physical downlink control channel (PDCCH) indicating a start and a duration of a transmission opportunity (TXOP); code for causing the first wireless communication device to determine, based at least on the start and the duration of the TXOP, whether to transmit a random access message within the TXOP using a category 2 LBT mode, or not within the TXOP using a category 4 LBT mode; and code for causing the first wireless communication device to communicate with the second wireless communication device, the random access message based on the determination.

~~30~~29. The non-transitory computer-readable medium of claim ~~29~~28, wherein the LBT mode is ~~a~~the category 4 LBT mode, ~~a~~the category 2 LBT mode, or a no LBT mode.

~~31~~30. The non-transitory computer-readable medium of claim ~~29~~28, wherein the mode information is communicated via at least one of ~~a~~the group-common PDCCH, an uplink (UL) grant in a downlink (DL) message, or a DL grant for the DL message~~, or a DL grant for the DL message.~~.

~~32~~31. The non-transitory computer-readable medium of claim ~~29~~28, wherein the random access message includes at least one of a random access preamble, ~~an~~ a random access response (RAR~~,~~), a connection request, a connection response, or an acknowledgement for the connection response.