CLAIMS

What is Claimed:

1. A wireless transmit/receive unit comprising,

a processor configured to:

receive a first downlink control information (DCI) associated with a first downlink transmission, wherein the first DCI indicates a first code block (CB)-based hybrid automatic repeat request (HARQ) feedback is to be provided for the first downlink transmission;

receive the first downlink transmission that comprises at least one transport block (TB), wherein the at least one TB comprises one or more code block groups (CBGs), and wherein each CBG comprises one or more code blocks;

transmit the first CB-based HARQ feedback associated with the first downlink transmission;

receive a second DCI associated with a second downlink transmission, wherein the second downlink transmission comprises a retransmission of at least a portion of the first downlink transmission;

receive the second downlink transmission; and

transmit a second CB-based HARQ feedback associated with the second downlink transmission based on a determination that the second DCI indicates that the second CB-based HARQ feedback is to be provided for the second downlink transmission comprising at least a portion of the first downlink transmission.

2. The wireless transmit/receive unit of claim 1, wherein the processor is further configured to determine a mapping of the one or more code blocks into one or more CBGs in at least one of frequency domain or a time domain.

3. The wireless transmit/receive unit of claim 1, wherein the first CB-based HARQ feedback associated with the first downlink transmission or the second CB-based HARQ feedback associated with the second downlink transmission is an acknowledgement (ACK) if each of the corresponding code blocks was successfully decoded and a negative acknowledgement (NACK) if one or more of the one or more code blocks were not successfully decoded.

4. The wireless transmit/receive unit of claim 1, wherein the second DCI indicates which CBGs are for retransmission.

5. The wireless transmit/receive unit of claim 4, wherein the second DCI indicates which CBGs included in the retransmission can be combined with previously received CBGs when performing soft decoding, wherein the first downlink transmission or the second downlink transmission is associated with a HARQ process.

6. The wireless transmit/receive unit of claim 1, wherein the second DCI comprises a bitmap, wherein the bitmap indicates which CBGs in the retransmission can be combined with previously received CBGs when performing soft decoding.

7. The wireless transmit/receive unit of claim 2, wherein the mapping is based on one or more of: a number of subcarriers or orthogonal frequency division multiplexing (OFDM) symbols assigned to the one or more CBGs, a maximum code block length, a number of code block groups in the first downlink transmission, a number of code blocks in the first downlink transmission, and one or more of a number of time symbols, or a number of resource blocks occupied by a potential pre-empting transmission.

8. The wireless transmit/receive unit of claim 1, further comprising a HARQ buffer, wherein the processor is further configured to manage the HARQ buffer and to discard data in the HARQ buffer if the one or more code blocks are not successfully decoded.

9. The wireless transmit/receive unit of claim 1, wherein the processor is further configured to receive a number of CBGs count via a higher layer configuration, the number of CBGs count indicating the number of CBGs received by the WTRU in the first downlink transmission on a physical downlink shared channel (PDSCH).

10. A method implemented by a wireless transmit/receive unit (WTRU), the method comprising,

receiving a first downlink control information (DCI) associated with a first downlink transmission, wherein the first DCI indicates a first code block (CB)-based hybrid automatic repeat request (HARQ) feedback is to be provided for the first downlink transmission;

receiving the first downlink transmission that comprises at least one transport block (TB), wherein the at least one TB comprises one or more code block groups (CBGs), and wherein each CBG comprises one or more code blocks;

transmitting the first CB-based HARQ feedback associated with the first downlink transmission;

receiving a second DCI associated with a second downlink transmission, wherein the second downlink transmission comprises a retransmission of at least a portion of the first downlink transmission;

receiving the second downlink transmission; and

transmitting a second CB-based HARQ feedback associated with the second downlink transmission based on a determination that the second DCI indicates that the second CB-based HARQ feedback is to be provided for the second downlink transmission comprising at least a portion of the first downlink transmission..

11. The method of claim 10 comprising determining a mapping of the one or more code blocks into one or more CBGs in at least one of frequency domain or a time domain.

12. The method of claim 10, wherein the first CB-based HARQ feedback associated with the first downlink transmission or the second CB-based HARQ feedback associated with the second downlink transmission is an acknowledgement (ACK) if each of the corresponding code blocks was successfully decoded and a negative acknowledgement (NACK) if one or more of the one or more corresponding code blocks were not successfully decoded.

13. The method of claim 10, wherein the second DCI indicates which CBGs are for retransmission.

14. The method of claim 13, wherein the second DCI indicates which CBGs included in the retransmission can be combined with previously received CBGs when performing soft decoding, wherein the first downlink transmission or the second downlink transmission is associated with a HARQ process.

15. The method of claim 10, wherein the second DCI comprises a bitmap, wherein the bitmap indicates which CBGs in the retransmission can be combined with previously received CBGs when performing soft decoding.

16. The method of claim 11, wherein the mapping is based on one or more of: a number of subcarriers or orthogonal frequency division multiplexing (OFDM) symbols assigned to the one or more CBGs, a maximum code block length, a number of code block groups in the first downlink transmission, a number of code blocks in the first downlink transmission, and one or more of a number of time symbols, or a number of resource blocks occupied by a potential pre-empting transmission.

17. The method of claim 10, further comprising:

a HARQ buffer; and

managing the HARQ buffer and discarding data in the HARQ buffer if the one or more code blocks are not successfully decoded.

18. The method of claim 10, further comprising receiving a number of CBGs count via a higher layer configuration, the number of CBGs count indicating the number of CBGs received by the WTRU in the first downlink transmission on a physical downlink shared channel (PDSCH).