CLAIMS

What is Claimed:

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

receiving configuration information indicating (i) a plurality of small data transmission (SDT) resources, (ii) one or more data radio bearers (DRBs) which support SDT, (iii) an inactive radio network temporary identifier (I-RNTI), and (iv) a time amount of a timing advance (TA) timer associated with SDT;

on condition that (1) a size of UL SDT data present in a buffer of the WTRU is less than a first threshold, (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT, and (3) a reference signal received power (RSRP) is greater than a second threshold:

selecting, based on the TA timer not expiring, a configured grant (CG) from among the plurality of SDT resources; and

sending, using the selected CG, a first transmission that includes a radio resource control (RRC) resume message, the I-RNTI and at least a portion of the UL SDT data present in the buffer.

2. The method of claim 1, wherein at least part of the configuration information is received via radio resource control (RRC) signaling.

3. The method of claim 1, wherein the configuration information includes information indicating the first threshold and the second threshold.

4. The method of claim 1, further comprising:

receiving a physical downlink control channel (PDCCH) transmission using a SDT search space,

wherein the PDCCH transmission is associated with the first transmission and is scrambled by a cell radio network temporary identifier (C-RNTI).

5. The method of claim 4, further comprising:

receiving configuration information indicating the SDT search space.

6. The method of claim 4, wherein the PDCCH transmission is received within a CG response window which starts at the sending of the first transmission.

7. The method of claim 1, further comprising:

monitoring, in a SDT search space during a CG response window, for a physical downlink control channel (PDCCH) transmission associated with the first transmission and scrambled by a cell radio network temporary identifier (C-RNTI),

wherein the CG response window starts at the sending of the first transmission.

8. The method of claim 7, further comprising:

determining that the first transmission was unsuccessful based on the CG response window expiring without receiving the PDCCH transmission; and

on condition that the first transmission was unsuccessful, resending at least the portion of the UL SDT data present in the buffer.

9. The method of claim 1, further comprising:

determining the TA timer has not expired since reception of a TA command.

10. A wireless transmit/receive unit (WTRU) comprising:

a processor and a transceiver which are configured to:

receive configuration information indicating (i) a plurality of small data transmission (SDT) resources, (ii) one or more data radio bearers (DRBs) which support SDT, (iii) an inactive radio network temporary identifier (I-RNTI), and (iv) a time amount of a timing advance (TA) timer associated with SDT,

on condition that (1) a size of UL SDT data present in a buffer of the WTRU is less than a first threshold, (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT, and (3) a reference signal received power (RSRP) is greater than a second threshold:

selecting, based on the TA timer not expiring, a configured grant (CG) from among the plurality of SDT resources, and

send, using the selected CG, a first transmission that includes a radio resource control (RRC) resume message, the I-RNTI and at least a portion of the UL SDT data present in the buffer.

11. The WTRU of claim 10, wherein at least part of the configuration information is received via radio resource control (RRC) signaling.

12. The WTRU of claim 10, wherein the configuration information includes information indicating the first threshold and the second threshold.

13. The WTRU of claim 10, wherein the processor and the transceiver are configured to:

receive a physical downlink control channel (PDCCH) transmission using a SDT search space, and

wherein the PDCCH transmission is associated with the first transmission and is scrambled by a cell radio network temporary identifier (C-RNTI).

14. The WTRU of claim 13, wherein the processor and the transceiver are configured to:

receive configuration information indicating the SDT search space.

15. The WTRU of claim 13, wherein the PDCCH transmission is received within a CG response window which starts at the sending of the first transmission.

16. The WTRU of claim 10, wherein the processor and the transceiver are configured to:

monitoring, in a SDT search space during a CG response window, for a physical downlink control channel (PDCCH) transmission associated with the first transmission and scrambled by a cell radio network temporary identifier (C-RNTI), and

wherein the CG response window starts at the sending of the first transmission.

17. The WTRU of claim 16, wherein the processor and the transceiver are configured to :

determine that the first transmission was unsuccessful based on the CG response window expiring without receiving the PDCCH transmission, and

on condition that the first transmission was unsuccessful, resend at least the portion of the UL SDT data present in the buffer.

18. The WTRU of claim 10, wherein the processor and the transceiver are configured to:

determine the TA timer has not expired since reception of a TA command.

19. The WTRU of claim 10, wherein at least part of the configuration information is received via broadcast signaling.