What is Claimed:

1. A wireless transmit/receive unit (WTRU) comprising a processor configured, at least in part, to:

determine whether the WTRU has D2D data to transmit; and

on a condition that the WTRU has D2D data to transmit:

determine a set of allowed scheduling assignment (SA) resources,

determine an SA resource for transmission of an SA from the set of allowed SA resources,

transmit the SA according to a first transmission period using the determined SA resource and according to determined transmission parameters,

determine a set of allowed device-to-device (D2D) data resources,

select one or more transmission patterns,

select one or more transmission parameters, and

transmit D2D data over the set of allowed D2D data resources according to a second transmission period using the selected transmission patterns according to the selected transmission parameters.

2. The WTRU of claim 1, wherein the D2D data comprises data mapped to a D2D service.

3. The WTRU of claim 1, wherein the transmission parameters are associated with the D2D data.

4. The WTRU of claim 1, wherein a transmission pattern comprise one or more of a set of time units or a set of physical resource blocks associated with each time unit.

5. The WTRU of claim 1, wherein the transmission patterns are selected from a set of pre-configured set of transmission patterns.

6. The WTRU of claim 5, wherein the processor is configured to select a transmission pattern, wherein the transmission pattern is based on one or more of a WTRU

ID, a transmission pattern index, a transmission parameter or a scheduling assignment (SA) resource.

7. The WTRU of claim 1, wherein the transmission parameters comprise one or more of Transport Block Size (TBS), modulation and coding scheme (MCS), bandwidth (BW), number of Physical Resource Blocks (PRBs), number of HARQ processes, inter-PDU interval time, number of HARQ transmissions.

8. (Cancelled)

9. The WTRU of claim 1, wherein the processor is configured to determine the set of allowed D2D resources or allowed SA resources based on a received signal from an evolved node B (eNB), wherein the received signal is a dedicated RRC configuration signal or a signal broadcasted on a System Information Block (SIB).

10. The WTRU of claim 1, wherein the processor is configured to determine the set of allowed D2D resources or allowed SA resources based on a signal received from a second WTRU.

11. The WTRU of claim 10, wherein the signal is received via a Physical D2D Synchronization Channel (PD2DSCH) or a D2D-related control message.

12. The WTRU of claim 1, wherein the set of allowed D2D data resources or allowed SA resources are pre-configured.

13. The WTRU of claim 1, wherein the processor is configured to randomly select the SA resource for transmission from the set of allowed SA resources.

14. A device-to-device (D2D) communication method comprising:

determining whether the WTRU has D2D data to transmit; and

on a condition that the WTRU has D2D data to transmit:

determining a set of allowed scheduling assignment (SA) resources,

determining an SA resource for transmission of an SA from the set of allowed SA resources,

transmit the SA according to a first transmission period using the determined SA resource according to determined transmission parameters,

determining a set of allowed D2D data resources,

selecting one or more transmission patterns,

selecting one or more transmission parameters, and

transmitting D2D data over the set of allowed D2D data resources according to a second transmission period using the selected transmission patterns according to the selected transmission parameters.

15. The method of claim 14, wherein the D2D data comprises data mapped to a D2D service.

16. The method of claim 14, wherein the transmission parameters are associated with the D2D data.

17. The method of claim 14, wherein a transmission pattern comprise one or more of a set of time units or a set of physical resource blocks associated with each time unit.

18. The method of claim 14, wherein the transmission patterns are selected from a set of pre-configured set of transmission patterns.

19. The method of claim 18, wherein comprising selecting a transmission pattern, wherein the transmission pattern is based on one or more of a WTRU ID, a transmission pattern index, a transmission parameter or a scheduling assignment (SA) resource.

20. The method of claim 14, wherein the transmission parameters comprise one or more of Transport Block Size (TBS), modulation and coding scheme (MCS), bandwidth (BW), number of Physical Resource Blocks (PRBs), number of HARQ processes, inter-PDU interval time, number of HARQ transmissions.

21. (Cancelled)

22. The method of claim 14, comprising determining the set of allowed D2D resources or allowed SA resources based on a received signal from an evolved node B (eNB), wherein the received signal is a dedicated RRC configuration signal or a signal broadcasted on a System Information Block (SIB).

23. The method of claim 14, comprising determining the set of allowed D2D resources or allowed SA resources based on a signal received from a second WTRU.

24. The method of claim 23, wherein the signal is received via a Physical D2D Synchronization Channel (PD2DSCH) or a D2D-related control message.

25. The method of claim 14, wherein the set of allowed D2D data resources or allowed SA resources are pre-configured.

26. The method of claim 14, comprising randomly selecting the SA resource for transmission from the set of allowed SA resources.

What is claimed is:

1. A wireless transmit/receive unit (WTRU) comprising a processor configured, at least in part, to:

determine whether the WTRU has D2D data to transmit; and

on a condition that the WTRU has D2D data to transmit:

determine a set of allowed scheduling assignment (SA) resources,

determine an SA resource for transmission of an SA from the set of allowed SA resources,

transmit the SA according to a first transmission period using the determined SA resource and according to determined transmission parameters,

determine a set of allowed device-to-device (D2D) data resources,

select one or more transmission patterns,

select one or more transmission parameters, and

transmit D2D data over the set of allowed D2D data resources according to a second transmission period using the selected transmission patterns according to the selected transmission parameters.

2. The WTRU of claim 1, wherein the D2D data comprises data mapped to a D2D service.

3. The WTRU of claim 1, wherein the transmission parameters are associated with the D2D data.

4. The WTRU of claim 1, wherein a transmission pattern comprises one or more of a set of time units or a set of physical resource blocks associated with each time unit.

5. The WTRU of claim 1, wherein the transmission patterns are selected from a set of pre-configured set of transmission patterns, and wherein the processor is configured to

select a transmission pattern, wherein the transmission pattern is based on one or more of a WTRU ID, a transmission pattern index, a transmission parameter or a scheduling assignment (SA) resource.

6. The WTRU of claim 1, wherein the transmission parameters comprise one or more of Transport Block Size (TBS), modulation and coding scheme (MCS), bandwidth (BW), number of Physical Resource Blocks (PRBs), number of HARQ processes, inter-PDU interval time, number of HARQ transmissions.

7. The WTRU of claim 1, wherein the processor is configured to determine the set of allowed D2D resources or allowed SA resources based on a received signal from an evolved node B (eNB), wherein the received signal is a dedicated RRC configuration signal or a signal broadcasted on a System Information Block (SIB).

8. The WTRU of claim 1, wherein the processor is configured to determine the set of allowed D2D resources or allowed SA resources based on a signal received from a second WTRU, wherein the signal is received via a D2D channel using a D2D related control message.

9. The WTRU of claim 1, wherein the set of allowed D2D data resources or allowed SA resources are pre-configured.

10. The WTRU of claim 1, wherein the processor is configured to randomly select the SA resource for transmission from the set of allowed SA resources.

11. A device-to-device (D2D) communication method comprising:

determining whether the WTRU has D2D data to transmit; and

on a condition that the WTRU has D2D data to transmit:

determining a set of allowed scheduling assignment (SA) resources,

determining an SA resource for transmission of an SA from the set of allowed SA resources,

transmit the SA according to a first transmission period using the determined SA resource according to determined transmission parameters,

determining a set of allowed D2D data resources,

selecting one or more transmission patterns,

selecting one or more transmission parameters, and

transmitting D2D data over the set of allowed D2D data resources according to a second transmission period using the selected transmission patterns according to the selected transmission parameters.

12. The method of claim 11, wherein the D2D data comprises data mapped to a D2D service.

13. The method of claim 11, wherein the transmission parameters are associated with the D2D data.

14. The method of claim 11, wherein a transmission pattern comprises one or more of a set of time units or a set of physical resource blocks associated with each time unit.

15. The method of claim 11, wherein the transmission patterns are selected from a set of pre-configured set of transmission patterns, and wherein comprising selecting a transmission pattern, wherein the transmission pattern is based on one or more of a WTRU ID, a transmission pattern index, a transmission parameter or a scheduling assignment (SA) resource.

16. The method of claim 11, wherein the transmission parameters comprise one or more of Transport Block Size (TBS), modulation and coding scheme (MCS), bandwidth (BW), number of Physical Resource Blocks (PRBs), number of HARQ processes, inter-PDU interval time, number of HARQ transmissions.

17. The method of claim 11, comprising determining the set of allowed D2D resources or allowed SA resources based on a received signal from an evolved node B (eNB),

wherein the received signal is a dedicated RRC configuration signal or a signal broadcasted on a System Information Block (SIB).

18. The method of claim 11, comprising determining the set of allowed D2D resources or allowed SA resources based on a signal received from a second WTRU, wherein the signal is received via a D2D channel using a D2D related control message.

19. The method of claim 11, wherein the set of allowed D2D data resources or allowed SA resources are pre-configured.

20. The method of claim 11, comprising randomly selecting the SA resource for transmission from the set of allowed SA resources.