

CLAIMS

What is claimed is:

1. A method, comprising:
 - initiating, by a communication device comprising a processor, a first multiple-input and multiple-output (MIMO) communication session with a primary cell;
 - receiving, by the communication device, information descriptive of a plurality of secondary cells to enable the communication device to communicate with one or more of the plurality of secondary cells,
 - wherein the primary cell comprises a primary antenna system having a first communication range,
 - wherein each of the plurality of secondary cells comprises a secondary antenna system having a second communication range that is a subset of the first communication range of the primary antenna system, and
 - wherein the plurality of secondary cells are physically distributed to provide communication coverage as cell sites within the first communication range of the primary cell;
 - initiating, by the communication device, a second MIMO communication session with a first secondary cell of the plurality of secondary cells while the first MIMO communication session with the primary cell is in use; and
 - initiating, by the communication device, a transition to a second secondary cell of the plurality of secondary cells while the first MIMO communication session with the primary cell is in use responsive to detecting a communication condition with the first secondary cell.
2. The method of claim 1, wherein the first MIMO communication session and the second MIMO communication session are simultaneously in use.

3. The method of claim 1, wherein the communication device comprises a plurality of antennas having a reduced radio frequency (RF) signal correlation between antenna ports coupled thereto.
4. The method of claim 3, wherein the plurality of antennas are configured to combine common mode currents and differential mode currents resulting in the reduced RF signal correlation between the antenna ports.
5. The method of claim 1, wherein the primary cell comprises a macro cell, and wherein the secondary cell comprises a small cell.
6. The method of claim 5, wherein the macro cell is utilized for real-time communications, and wherein the small cell is utilized for non-real-time communications.
7. The method of claim 1, further comprising receiving instructions from the primary cell directing the communication device to utilize the first secondary cell for non-real-time communications via the second MIMO communication session.
8. The method of claim 1, wherein initiating the transition to the second secondary cell comprises initiating a third MIMO session with the second secondary cell.
9. The method of claim 8, wherein the third MIMO session is initiated while the second MIMO session is in use, and wherein the second MIMO session is terminated when an active data communication session in the second MIMO session transitions to the third MIMO session without causing an interruption to the data communication session.
10. The method of claim 8, wherein the second MIMO session is terminated causing an active data communication session in the second MIMO session to be interrupted, and wherein the active communication session is reestablished in the third MIMO session.

11. The method of claim 8, wherein the second MIMO communication session is initiated with the first secondary cell responsive to receiving instructions from the primary cell.
12. The method of claim 1, wherein the communication device utilizes a plurality of antennas each having a first band and a second band of operation, wherein the first MIMO communication session utilizes the first band, and wherein the second MIMO communication session utilizes the second band.
13. The method of claim 1, wherein the initiating the transition to the second secondary cell is performed without receiving a directive from the primary cell to initiate the transition to the second secondary cell.
14. The method of claim 13, wherein the initiating the transition to the second secondary cell is responsive to instructions received from the second secondary cell.
15. The method of claim 13, wherein the initiating the transition to the second secondary cell is responsive to a determination by the communication device to initiate the transition.
16. The method of claim 1, wherein the first MIMO communication session with the primary cell provides the communication device access to a control channel of the primary cell.
17. The method of claim 1, wherein the communication condition comprises a degradation in communications with the first secondary cell.
18. The method of claim 1, wherein the communication condition comprises an out-of-communication range condition with the first secondary cell.

19. A communication device, comprising:
an antenna system;
a memory to store instructions; and
a processor coupled to the memory and the antenna system, wherein responsive to executing the instructions the processor performs operations comprising:
initiating a first multiple-input and multiple-output (MIMO) communication session with a primary base station;
initiating a second MIMO communication session with a first secondary base station of a plurality of secondary base stations,
wherein the primary base station comprises a primary antenna system having a first communication range,
wherein each of the plurality of secondary base stations comprises a secondary antenna system having a second communication range that is a subset of the first communication range of the primary antenna system, and
wherein the plurality of secondary base stations correspond to a plurality of micro cell sites distributed within the first communication range of the primary base station; and
transitioning to a second secondary base station without terminating the first MIMO communication session with the primary base station.
20. The communication device of claim 19, wherein the operations further comprise redirecting a portion of communications from the primary base station to the first secondary base station via the second MIMO communication session.
21. The communication device of claim 20, further comprising terminating in the first MIMO communication session the portion of communications redirected to the first secondary base station.

22. The communication device of claim 20, wherein transitioning to the second secondary base station comprises initiating a third MIMO session with the second secondary base station responsive to detecting a degradation in communications with the first secondary base station or an out-of-communication range condition with the first secondary base station.

23. A machine-readable storage device, comprising instructions, wherein responsive to the instructions being executed by a processor, the processor performs operations comprising:

initiating a first multiple-input and multiple-output (MIMO) communication session with a primary base station; and

initiating a second MIMO communication session with a first secondary base station of a plurality of secondary base stations without terminating the first MIMO communication session with the primary base station,

wherein the primary base station comprises a primary antenna system having a first communication range,

wherein each of the plurality of secondary base stations comprises a secondary antenna system having a second communication range that is a subset of the first communication range of the primary antenna system, and

wherein the plurality of secondary base stations correspond to a plurality of small cell sites distributed within the first communication range of the primary base station.

24. The machine-readable storage device of claim 23, wherein the operations further comprise receiving information from the primary base station descriptive of the plurality of secondary base stations to enable communications with any of the plurality of secondary base stations.

25. The machine-readable storage device of claim 23, wherein the operations further comprise transitioning to a second secondary base station without terminating the first MIMO communication session with the primary base station responsive to detecting a degradation in communications with the first secondary base station or an out-of-communication range condition with the first secondary base station.