CLAIMS

1. A method of periodic location determination on a mobile device, comprising: setting a location determination timer; transitioning a GNSS receiver to a low-powered state; transitioning a wide area network (WAN) wireless modem, on the mobile device, to a low power modem state, wherein the low power modem state comprises powering down the WAN wireless modem; in response to expiration of a paging slot timer, transitioning the WAN wireless modem to a powered state; in response to expiration of the location determination timer during the low power modem state, in absence of a pending application related request for position update, and subsequent expiration of the paging slot timer: transitioning the GNSS receiver to a powered state; measuring GNSS signal information; and transitioning the GNSS receiver into the low-powered state; and transitioning the WAN wireless modem to the low power modem state.

2. The method of claim 1, wherein a period of the paging slot timer is shorter than a period of the location determination timer.

3. The method of claim 1, further comprising: receiving, at the mobile device, a base station almanac; and determining, using the base station almanac, a GNSS-based location of the mobile device.

4. The method of claim 1, further comprising: receiving, at the mobile device, long-term orbital predictions; and determining a GNSS-based location of the mobile device using the long-term orbital predictions.

5. The method of claim 4, wherein the long-term orbital predictions comprise long-term orbital predictions effective for a week.

6. The method of claim 1, further comprising determining a GNSS-based location of the mobile device comprising: acquiring a WAN frequency reference; estimating GNSS time; and determining GNSS pseudoranges.

7. The method of claim 1, further comprising determining a GNSS-based location of the mobile device comprising: determining an uncertainty associated with the stored GNSS-based location; comparing the determined uncertainty with a predetermined uncertainty threshold; and, responsive to the determined uncertainty exceeding the predetermined uncertainty threshold, determining an updated location of the mobile device.

8. The method of claim 1, further comprising: receiving a location request for the mobile device while the WAN wireless modem is in a powered state; and providing a stored GNSS-based location of the mobile device.

9. The method of claim 8, wherein receiving the location request comprises receiving a location request from an application on the mobile device.

10. The method of claim 8, wherein receiving the location request comprises receiving a message from an application server requesting the location of the mobile device.

11. The method of periodic location determination of a mobile device of claim 1, further comprising: in response to expiration of the location determination timer while the WAN wireless modem is in a high power state, determining a GNSS-based location.

12. A mobile device for periodic location determination, comprising: a memory; a global navigation satellite system (GNSS) receiver; a wide area network (WAN) wireless modem; and one or more processing units coupled to the memory and the WAN wireless modem, wherein the one or more processing units are configured to: set a location determination timer; transition the GNSS receiver to a low-powered state; transition the WAN wireless modem to a low power modem state, wherein the low power modem state comprises powering down the WAN wireless modem; in response to expiration of a paging slot timer, transitioning the WAN wireless modem to a powered state; in response to expiration of the location determination timer during the low power modem state, in absence of a pending application related request for position update, and subsequent expiration of the paging slot timer: transition the GNSS receiver to a powered state; measure GNSS signal information; and transition the GNSS receiver into the low-powered state; and transition the WAN wireless modem to the low power modem state.

13. The mobile device of claim 12, wherein: a period of the paging slot timer is shorter than a period of the location determination timer.

14. The mobile device of claim 12, wherein the one or more processing units are further configured to: receive, at the mobile device, a base station almanac; and determine, using the base station almanac, a GNSS-based location of the mobile device.

15. The mobile device of claim 12, wherein the one or more processing units are further configured to: receive, at the mobile device, long term orbital predictions; and determine a GNSS-based location of the mobile device based upon the long-term orbital predictions.

16. The mobile device of claim 15, wherein the long-term orbital predictions comprise long term orbital predictions effective for a week.

17. The mobile device of claim 12, wherein the one or more processing units are further configured to determine a GNSS-based location of the mobile device, comprising: the one or more processing units configured to: acquire a WAN frequency reference; estimate GNSS time; and determine GNSS pseudoranges.

18. The mobile device of claim 12, wherein the one or more processing units are further configured to determine a GNSS-based location of the mobile device, comprising the one or more processing units configured to: determine an uncertainty associated with the stored GNSS-

based location; compare the determined uncertainty with a predetermined uncertainty threshold; and, responsive to the determined uncertainty exceeding the predetermined uncertainty threshold, determine an updated location of the mobile device.

19. The mobile device of claim 12, wherein the one or more processing units are further configured to: receive a location request for the mobile device while the WAN wireless modem is in a powered state; and provide a stored GNSS-based location of the mobile device.

20. The mobile device of claim 19, wherein the one or more processing units configured to receive the location request comprise: one or more processing units configured to receive a location request from an application on the mobile device.

21. The mobile device of claim 19, wherein the one or more processing units configured to receive the location request comprise: one or more processing units configured to receive a message from an application server requesting the location of the mobile device.

22. The mobile device for periodic location determination of claim 12, wherein the processor is further configured to: in response to expiration of the location determination timer while the WAN wireless modem is in a high power state, determine a GNSS-based location.

23. A non-transitory computer-readable medium, having stored thereon computer-readable instructions to cause a processor to: set a location determination timer; transition a GNSS receiver to a low-powered state; transition a wide area network (WAN) wireless modem, on a mobile device, to a low power modem power state, wherein the low power modem state comprises powering down a WAN wireless modem; in response to expiration of a paging slot timer, transitioning the WAN wireless modem to a powered state; in response to expiration of the location determination timer during the low power modem state, in absence of a pending application related request for position update, and subsequent expiration of the paging slot timer: transition the GNSS receiver to a powered state; measure GNSS signal information; and transition the GNSS receiver into the low-powered state; and transition the WAN wireless modem to the low power modem state.

24. The non-transitory computer-readable medium of claim 23, wherein a period of the paging slot timer is shorter than a period of the location determination timer.

25. A mobile device for periodic location determination, comprising: means for setting a location determination timer; means for transitioning a GNSS receiver to a low-powered state; means for transitioning a wide area network (WAN) wireless modem, on the mobile device, to a low power modem state, wherein the low power modem state comprises powering down the WAN wireless modem; means for, in response to expiration of a paging slot timer, transitioning the WAN wireless modem to a powered state; means for, in response to expiration of the location determination timer during the low power modem state, in absence of a pending application related request for position update, and subsequent expiration of the paging slot timer: means for

transitioning the GNSS receiver to a powered state; means for measuring GNSS signal information; and means for transitioning the GNSS receiver into the low-powered state; and means for transitioning the WAN wireless modem to the low power modem state.

26. The mobile device of claim 25, wherein a period of the paging slot timer is shorter than a period of the location determination timer.