CLAIMS

We claim:

1. A mobile location system comprising:

a global navigation satellite systems **(GNSS)** processor;

a microelectromechanical systems (MEMS) processor, wherein the MEMS processor is an inertial measurement unit that comprises at least one accelerometer and at least one gyroscope;

a location processor;

a memory device that stores a plurality of instructions, which when executed by thelocation processor, causes the location processor to be configured to:

upon the detection of a first predetermined event:

receive a plurality of data streams from the **GNSS**

processor;

receive a plurality of MEMS data streams from the MEMS processor;

transmit, to a geomapping server, the plurality of data streams and plurality of MEMS data streams;

determine that at least one of the transmitted plurality of data streams and at least one of the plurality of MEMS data streams are associated with a legal parking zone;

based on the determination that the at least one of the transmitted plurality of data streams and the at least one of the plurality of MEMS data streams are associated with a legal parking zone:

receive, from the geomapping server, a legal parking zone message that the plurality of data streams and plurality of MEMS data streams are associated with the legal parking zone;

transmit, to the geomapping server, a parking session initiation message to initiate a parking session;

transmit, to the geomapping server, a parking session end message to endthe parking session upon detection of a second predetermined event; and

receive, from the geomapping server, a parking session end confirmation

message.

2. The mobile location system of claim 1, wherein the location processor further receives a receipt message that confirms the parking session payment transaction is complete.

3. The mobile location system of claim 1, wherein the detection of the first predetermined event comprises detecting that the mobile location system is moving less than a predetermined speed.

4. The mobile location system of claim 1, wherein the location processor further receives a timing pulse from the **GNSS** processor.

5. The mobile location system of claim 4, wherein the location processor further synchronizes the plurality of data streams and the plurality of MEMS data streams in accordance with the timing pulse.

6. The mobile location system of claim 5, wherein the location processor further converts the synchronized plurality of data streams and plurality of MEMS data streams into a plurality offinal coordinate data.

7. The mobile location system of claim 1, wherein initiating the parking session is automatic,without user input.

8. The mobile location system of claim 1, wherein the **GNSS** processor collects a predetermined quantity of location data points for a predetermined quantity of time.

9. The mobile location system of claim 1, wherein the detection of the second predetermined event comprises detecting that the mobile location system is moving faster than a predetermined speed.

10. The mobile location system of claim 1, wherein if the transmitted plurality of data streams are not associated with a legal parking zone, receive, from the geomapping server, a retry message.

11. The mobile location system of claim 10, wherein upon receiving the retry message, the location processor further:

receives a third plurality of data streams from the **GNSS** processor; and transmits, to the geomapping server, the third plurality of data streams.

12. The mobile location system of claim 10, wherein if a predetermined number of retry messages are received from the geomapping server within a predetermined time period, a message received from the geomapping server causes the location processor to alert a user thatthe parking session cannot be initiated.

13. A geomapping server comprising:

a processor; and

a memory device that stores a plurality of instructions, which when executed by the processor, causes the processor to be configured to:

receive, from a location device, a plurality of global navigation satellite systems (GNSS) data streams;

receive, from a microelectromechanical systems (MEMS) processor, a plurality of MEMS data streams;

compare the received plurality of GNSS data streams and the plurality of MEMS data streams with a stored plurality of coordinates;

determine if one or more of the received plurality of GNSS data streams matches and the plurality of MEMS data streams are associated with a legal parking zone;

if a match is determined:

transmit, to the location device, a legal parking zone message confirming that one or more of the received plurality of GNSS data streams and the plurality of MEMS data streams is associated with the legal parking zone;

receive, from the location device, a parking session initiation message to initiate a parking session;

start a parking session associated with the location device;

receive, from the location device, a parking session end message to terminate the parking session; and

transmit, to the location device, a parking session end confirmation message.

14. The geomapping server of claim 13, wherein the processor further:

transmits, to a payment processing server, parking session charge associated with the terminated parking session;

receive, from the payment processing server, a payment confirmation message; and transmit, to a mobile user device, the parking session end confirmation message that further comprises a payment receipt.

15. The geomapping server of claim 13, wherein the processor further:

stores real time parking session information associated with a plurality of different location devices;

receives, from a mobile user device, a request for real time parking space availability located near a particular coordinate;

evaluates a plurality of legal parking zones near the particular coordinate to determine if any of the plurality of different location devices vacated one of the plurality of legal parking zones within a predetermined period of time; and

if one of the plurality of different location devices vacated one of the plurality of legal parking zones within the predetermined period of time, transmit a parking coordinate associated with the one of the plurality of legal parking zones to the mobile user device.

16. The geomapping server of claim 13, wherein the processor further:

receives, from a plurality of different mobile user devices, information updates regarding a plurality of legal parking zones;

transmits, to the location device, a legal parking zone message confirming that one or more of the received plurality of GNSS data streams is associated with the legal parking zone based on the information updates regarding a plurality of legal parking zones.

17. The geomapping server of claim 13, wherein if the match is not determined, the location device is permitted to send additional pluralities of GNSS data streams a predetermined number of times.