identified and then accessed e.g. via a web browser for purchasing the necessary special, usually one-time, ticket prior to the actual utilization of the concerned transport service. This may also require registration in the concerned service provider systems and associated payment brokers, for example, which may be cumbersome and even difficult depending on e.g. the technical and linguistic skills of the particular traveler in question.

SUMMARY

Embodiments of the present invention at least alleviate one or more afore-reviewed drawbacks relating to the prior art solutions where the utilization of transport services in various regions often requires acquisition of a bunch of local tickets, even one for each leg of a journey.

This is particularly challenging from a standpoint of a casual user such as a tourist as explained hereinbefore. Also the analytics of the usage of transport services, billing, and implementation of necessary hardware, not forgetting the required human effort, would benefit from a novel approach overcoming the associated existing challenges.

According to a first aspect, there is provided an electronic mobile communication terminal device for accompanying a user of the device while travelling in a geographic region served locally by at least one transport provider, such as a transport authority and/or transport operator, offering passenger transport such as public transport services therein, said terminal device being configured to receive and store a digital token containing digitally signed data and issued by a remote mobility management system trusted, by default, by the transport provider, said token being allocated to the user as a digital proof of the user's subscription to the system, wherein the token exhibits a temporally limited right to utilize the transport services within the region, transmit a number of wireless signals to the system, including signals indicative of the times and corresponding locations of device during the user's stay within the region to facilitate the system keeping track of the movement and related usage of transport services in the region by the user, and indicate, responsive to a triggering event, the token including said digitally signed data wirelessly to a proximate verification apparatus associated with the transport provider to enable the verification apparatus to inspect the user's subscription based on the indicated token data and check the authenticity of the signature through the application of verification data associated with the system, determine, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

According to a second aspect, there is provided an electronic system for providing digitally assisted personal mobility management service to users, wherein the system covers a number of different geographic regions and operates in liaison with one or more transport providers offering passenger transport services in said regions, said system further being communication network accessible via an internet, and comprising one or more at least functionally connected servers, said system being configured to establish a digitally signed token to a user carrying a mobile communication terminal device for use as a digital proof of the user's subscription to the system, wherein the token exhibits a temporally limited default right to utilize the transport services offered by at least one transport provider within a region of said number of regions, transmit said digitally signed token to the device of the user, provide digital verification data to the transport provider to enable checking the authenticity of the signature, receive signals transmitted by and/or regarding the device, including

signals indicative of the times and corresponding locations of the device, determine based on the received signals information characterizing the usage of the transport services within the region by at least said user during the validity of the token, supply the determined usage information to the transport provider for analysis, verification, and/or billing purposes, and determine, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

According to a third aspect, there is provided a mobility management arrangement including the above device and the above system.

According to a fourth aspect, there is provided a method to be executed by an electronic mobile personal communication device carried by a user of the device while travelling in a region served by at least one transport provider, said method including: receiving and storing a digital token containing digitally signed data and issued by a remote mobility management system trusted, by default, by the transport provider, said token being provided to the user as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited right to utilize the transport services within the region, transmitting wireless signals including signals indicative of the times and corresponding locations of device to the management system to facilitate the system keeping track of the movement and related usage of transport services in the region by the user, indicating, responsive to a triggering event, the token including said digitally signed data wirelessly to a proximate verification apparatus to enable the verification apparatus to inspect the user's subscription as indicated by the token data and check the authenticity of the signature through the application of verification data associated with the system, and determining, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

According to a fifth aspect, there is provided a method to be executed by an electronic system for providing digitally assisted personal mobility management service to users, wherein the system covers a number of different geographical regions and operates in liaison with transport providers offering passenger transport services in the regions, said system further being communication network accessible and comprising one or more at least functionally connected servers, said method including: establishing a digitally signed token to a user carrying an electronic mobile personal communication device for use as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited default right to utilize the transport services offered by at least one transport provider within a region of said number of regions, transmitting said digitally signed token to the device of the user, providing verification data to the transport provider, to enable checking the authenticity of the signature, receiving signals transmitted by and/or at least regarding the device, including signals indicative of the times and corresponding locations of the device, determining based on the received signals information characterizing the usage of the transport services by at least said user within the region during the validity of the token, supplying the determined usage information to the transport provider for analysis, verification, and/or billing purposes, determining,

based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

According to a sixth aspect, there is provided a computer program comprising code means adapted, when run on a computer, to execute the above methods.

According to a seventh aspect, there is provided a non-transitory carrier medium including the above computer program.
Thereby in one resulting embodiment, an electronic mobile communication terminal device, optionally a smartphone, phablet, tablet or wearable such as wristop type device, for being carried by a user of the device while travelling in a geographic region served locally by at least one transport provider, such as a transport authority and/or transport operator, offering passenger transport such as public transport services therein, is configured to receive and store a digital token containing digitally signed data and issued by a remote mobility management system trusted, by default, by the transport provider, said token being allocated to the user as a digital proof of the user's subscription to the remote system, wherein the token exhibits a temporally limited right to utilize the transport services within the region, transmit a number of wireless, preferably radio frequency, signals to the system, said signals being optionally transmitted at regular or intermittent intervals, said signals including indications of the times and corresponding locations of device during the user's stay within the region to facilitate the system keeping track of the movement and related usage of transport services in the region by the user, and indicate, responsive to a triggering event, the token including said digitally signed data wirelessly to a proximate, optionally mobile, verification apparatus associated with the transport provider, e.g. other smartphone, phablet or tablet type device carried by an inspector, or a stationary or vehicle-installed verification apparatus, to enable the verification apparatus to inspect the user's subscription based on the indicated token data and particularly check the authenticity of the signature through the application of verification data associated with the system and stored in the apparatus preferably in advance.

In various embodiments, the terminal device comprises a wireless data transfer interface to transmit and receive data, at least one processor, and at least one memory storing instructions that, when executed by the at least one processor, cause the terminal device to perform the desired operations such as the ones stated above.

In various embodiments, the verification data may include a preferably temporally limited and/or region-specific public key or other verification key associated with the system. The data may additionally or alternatively include a digital signing certificate associated with the system and issued by the system or a third party certificate authority. Signing the token data has preferably been executed using a corresponding private key in accordance with a selected PKI (public key infrastructure) scheme.

In accordance with one other embodiment it is suggested an electronic system for providing digitally assisted personal mobility management service to users, wherein the system covers a number of, typically a plurality of, different geographic regions and operates in liaison with one or more transport providers offering passenger transport services in said regions, said system further being communication network accessible, preferably Internet accessible, and comprising

one or more at least functionally connected servers, said system being configured to establish a digitally signed token to a user carrying an electronic mobile personal communication device for use as a digital proof of the user's subscription to the system, wherein the token exhibits a temporally limited default right to utilize the transport services offered by at least one transport provider within a region, preferably only within said region, of said number of regions, transmit said digitally signed token to the device of the user, provide digital verification data to the transport provider to enable checking the authenticity of the signature, receive signals transmitted by and/or regarding the device, including signals indicative of the times and corresponding locations of the device, the received signals optionally including inertial sensor data and/or transport mode data, determine based on the received signals information characterizing the user's and potentially other users' usage of the transport services within the region during the validity of the token, and supply the determined usage information to the transport provider preferably for analysis, verification, and/or billing purposes.

In various embodiments, the system comprises a data transfer interface to transmit and receive data via a communication network, at least one processor, and at least one memory storing instructions that, when executed by the at least one processor, cause the system to perform the desired operations such as the ones stated above.

Various embodiments of the terminal device and/or of said one or more servers of the system may generally comprise at least one processing unit such as a processor or a microcontroller. Yet, at least one memory configured to store data including e.g. token data and functional logic data in the form of computer program code (defining e.g. a number of functional modules) executable by the at least one processing unit is advantageously provided. The code may be configured, when executed by the at least one processing unit, to cause the corresponding terminal and/or server device to perform one or more of the related above-mentioned activities. For implementing the associated information or generally data transfer, at least one communication interface, optionally a network interface, may be further included in the concerned terminal and/or server device, wherein e.g. a transceiver or a transmitter may be configured to transmit, or 'send', data, and/or e.g. a transceiver or receiver may be configured to receive data. In preferred embodiments, to indicate data such as token data visually e.g. to a user and/or a verification apparatus, the terminal device may include a display screen, optionally a touchscreen. Alternatively, the data may be indicated to the verification apparatus using a suitable communication interface thus applying e.g. radio frequencies for the purpose. In the case of especially terminal device, the utilized communication interface or interfaces, if a plurality is used, are preferably wireless.

Yet in a further embodiment, a method to be executed by an electronic mobile personal communication device, optionally a smartphone, phablet, tablet or wearable such as wristop type device, for being carried by a user of the device while travelling in a region served by at least one transport provider, comprises: receiving and storing a digital token containing digitally signed data and issued by a remote mobility management system trusted, by default, by the transport provider, said token being provided to the user as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited right to utilize the transport services within the region, transmitting wireless signals including signals indicative of the times and corresponding locations of device to the management system to facilitate the system keeping track of the movement and related usage of transport services in the region by the user, and indicating, responsive to a triggering event, the token including said digitally signed data wirelessly to a proximate, preferably mobile, verification apparatus to enable the verification apparatus to inspect the user's subscription as indicated by the token data and

check the authenticity of the signature through the application of verification data associated with the system and stored in the apparatus.

Still in one embodiment, a method to be executed by an electronic system for providing digitally assisted personal mobility management service to users, wherein the system covers a number of different geographical regions and operates in liaison with transport providers offering passenger transport services in the regions, said system further being communication network accessible and comprising one or more at least functionally connected servers, comprises: establishing a digitally signed token to a user carrying an electronic mobile personal communication device for use as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited default right to utilize the transport services offered by at least one transport provider within a region of said number of regions, transmitting said digitally signed token to the device of the user, providing verification data to the transport provider, to enable checking the authenticity of the signature, receiving signals transmitted by and/or at least regarding the device, including signals indicative of the times and corresponding locations of the device, determining based on the received signals information characterizing at least the user's usage of the transport services within the region during the validity of the token, and supplying the determined usage information to the transport provider preferably for analysis, verification, and/or billing purposes.

In some embodiments, a data access portal embodied in an online system, such as server-operated Internet-accessible system, may be implemented to store and/or supply the usage information to a number of parties such as transport providers.

The utility of embodiments of the present invention arises from a variety of issues depending on each particular embodiment. The end users such as tourists, other visitors or locals generally achieve a greater freedom to flexibly move around different regions using available transport services without a need to purchase different travel passes or tickets in advance to each region or even more commonly to each specific transport service, e.g. bus service or particular bus line, or just for a single leg, anymore. The service arrangement established by the embodiments of present invention, such as a mobility management system on the network side and user terminals on a client/user side, thus supplements or replaces, depending on the viewpoint taken, the traditional travel tickets or essentially ticket type passes with more dynamic option that requires minimum action and practically allows somewhat complete passivity from the users thereof. The users may subscribe to the suggested service operated by the presented mobility management system to be able to validly utilize transport services within a region without a traditional ticket acquired beforehand or during the concerned journey. Benefits for the transport providers include e.g. reduced cost, more accurate income distribution and more versatile data such as statistics available for capacity planning.

To achieve the above scenario, the mobility management system in accordance with an embodiment of the present invention preferably establishes first a general (being not associated with any particular end user/traveler) trusted relationship, or liaison, with a number of transport providers of each region. During the process, a number of persons being in charge of the system and regional businesses may naturally legally agree on the cooperation and conclude related contracts, but in a

Claims

1. An electronic mobile communication terminal device (104) for accompanying a user (102) of the device while travelling in a geographic region (106) served locally by at least one transport provider (116), such as a transport authority and/or transport operator, offering passenger transport such as public transport services (120) therein, said terminal device being configured to

receive and store a digital token (103) containing digitally signed data and issued by a remote mobility management system (114) trusted, by default, by the transport provider, said token being allocated to the user as a digital proof of the user's subscription to the system, wherein the token exhibits a temporally limited right to utilize the transport services within the region,

transmit a number of wireless signals to the system, including signals indicative of the times and corresponding locations of device during the user's stay within the region to facilitate the system keeping track of the movement and related usage of transport services in the region by the user, and

indicate, responsive to a triggering event, the token including said digitally signed data wirelessly to a proximate verification apparatus (109) associated with the transport provider to enable the verification apparatus to inspect the user's subscription based on the indicated token data and check the authenticity of the signature through the application of verification data associated with the system,

determine, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

2. The device of claim 1, wherein the token is indicated said signed data is established using a private signing key associated with the system.

3. The device of claim 1, wherein the digitally signed data is indicated in other electronic mobile communication terminal device carried by an inspector, a stationary or vehicle-installed verification apparatus,

4. The device of claim 1, wherein said verification data includes a public key associated with the system.

5. The device of claim 1, wherein said verification data is stored in the verification apparatus.

6. The device of claim 1, wherein the characteristic is determined based on a selected analysis period such as the validity period of the token or a selected reporting period,

7. The device of claim 1, comprising a display screen (206), said device being configured to indicate the token to the verification apparatus optically via the display screen to enable optical reading thereof by the verification apparatus.

8. The device of claim 7, wherein the display screen displays numeric characters, alphabetic characters, alphanumeric characters or graphical code such as a matrix code,

9. The device of claim 7, wherein the verification is done by a camera of the verification apparatus.

10. The device of any preceding claim, configured to indicate the token to the verification apparatus utilizing short-range wireless radio frequency technology.

11. The device of claim 10, wherein the short-range wireless radio frequency technology is selected from the group consisting of RFID, NFC, other radio frequency tag, infrared, sound, ultrasound, Bluetooth, or Bluetooth low energy compliant technology.

12. The device of any preceding claim, wherein the token comprises or indicates at least one element selected from the group consisting of: user ID, anonymous or anonymized user ID, device ID, signature established using a private key associated with the system, signature including a message digest obtained through hashing at least part of the token data content, expiry time, start time, duration of validity, region of validity, shared secret such as symmetric key, issuer ID, image characterizing the region and/or transport provider, graphical theme characterizing the region and/or transport provider, and biometric evidence representing the user.

13. The device of claim 12, wherein the token comprises or indicates a photograph or fingerprint data.

14. The device of any preceding claim, configured to transmit a wireless notification signal indicative of the current location to the management system.

15. The device of claim 14, wherein the wireless notification signal is transmitted automatically, or in response to predefined user input such as a token request, or in response to which the token specific to the region including said location is issued by the system and received in the device.

16. The device of any preceding claim, configured to establish and transmit, as a wireless signal, a digital travel plan in accordance with the control input by the user to the management system, said plan being indicative of the user's visit to the region.

17. The device of claim 16, wherein the wireless signal is transmitted in response to which the token specific to the region including said location is issued by the system and received in the device.

18. The device of any preceding claim, wherein the triggering event contains at least one element selected from the group consisting of: receipt of user input via a user interface of the device instructing to indicate the token, detection of verification apparatus in range, and receipt of interrogation signal from the verification apparatus.

19. The device of any preceding claim, configured to determine an indication of the current location based on at least one element selected from the group consisting of: satellite positioning signal, GPS signal, GLONASS signal, wireless network signal, cellular signal, wireless LAN signal, inertial sensor, camera image, camera view, tag signal received, and audio signal captured via a microphone.

20. The device of any preceding claim, configured to determine the transport mode of the user and include mode information in the transmitted wireless signals, wherein mode information is determined based on at least one element selected from the group consisting of: sensor data, inertial sensor data, accelerometer data, magnetometer data, gyroscope data, location data, satellite positioning data, network data, cell identification data, Wi-Fi hotspot data, image data, sound data, wirelessly read tag data, time data, calendar date, time of the day, day of the week, transport service route information, and transport service schedule.

21. The device of claim 9, wherein the determined mode information indicates at least one element selected from the group consisting of: road transport, water transport, rail transport, passenger car, bus, boat or ferry, tram, train, underground, walking, running, cycling, time of getting aboard, time of getting off, leg duration, number of transport line stops such as bus stops, number of stop intervals, day of the week, calendar date.

22. The device of any preceding claim, wherein the transmitted wireless signals incorporate sensor data to enable determining the transport mode of the device remotely.

23. The device of claim 22, wherein the sensor data comprises inertial sensor data, such as accelerometer, gyroscope or magnetometer data

24. The device of any preceding claim, configured to transmit said wireless signals over a cellular or wireless local area network towards the management system.

25. The device of any preceding claim, configured to buffer time and location data for wireless transmission.

26. The device of claim 25, further configured to buffer determined transport mode data.

27. The device of claim 25, wherein the wireless transmission is made in response to the availability of network coverage applicable for the transmission.

28. The device of any preceding claims, configured to provide a route suggestion to a user-indicated destination from the current location and to provide related real-time navigation guidance in the form of visual and/or audible cues.

29. The device of claim 28, further configured to include one or more legs in the suggested route, said legs involving the use of applicable transport services, wherein the applicability of a transport service, such as bus, tram, metro, minibus, aircraft, boat, or train, for travelling a leg of the suggested route is determined based on at least one element selected from the group consisting of: time of the day, day of the week, calendar, transport service route, transport service schedule, current time, traffic situation, distance to be travelled, and weather information.

30. The device of any preceding claim, configured to inactivate or delete the token responsive to detection of a fulfillment of at least one condition selected from the group consisting of: token expiry, exit from the region, receipt of revocation signal, and occurrence of other revocation event.

31. An electronic system (114) for providing digitally assisted personal mobility management service to users (102), wherein the system covers a number of different geographic regions (106) and operates in liaison with one or more transport providers (116) offering passenger transport services (120) in said regions, said system further being communication network (110) accessible

via an internet, and comprising one or more at least functionally connected servers, said system being configured to

establish a digitally signed token (103) to a user (102) carrying a mobile communication terminal device (104) for use as a digital proof of the user's subscription to the system, wherein the token exhibits a temporally limited default right to utilize the transport services offered by at least one transport provider within a region of said number of regions,

transmit said digitally signed token to the device of the user,

provide digital verification data to the transport provider to enable checking the authenticity of the signature,

receive signals transmitted by and/or regarding the device, including signals indicative of the times and corresponding locations of the device,

determine based on the received signals information characterizing the usage of the transport services within the region by at least said user during the validity of the token,

supply the determined usage information to the transport provider for analysis, verification, and/or billing purposes, and

determine, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

32. The system of claim 31, wherein the characteristic is determined based on a selected analysis period such as the validity period of the token or a selected reporting period,

33. The system of claim 31, wherein signing data, such as a private signing key associated with the system, used for signing and verification data, such as a public key associated with the system, are region-specific.

34. The system of any of claims 31-33, configured to determine the transport mode of the user based on the received signals, wherein mode information is determined based on at least one element selected from the group consisting of: sensor data, inertial sensor data, accelerometer data, magnetometer data, gyroscope data, location data, network data, cell identification data, Wi-Fi hotspot data, camera or generally image data, sound data, wirelessly read tag data, time data,

calendar date, time of the day, day of the week, transport service route information, and transport service schedule.

35. The system of claim 34, wherein the received signals comprises signals from sensor.

36. The system of any of claims 31-36, configured to determine or receive transport mode information indicative of at least one element selected from the group consisting of: road transport, water transport, rail transport, passenger car, bus, boat or ferry, tram, train, underground, walking, running, bus line, boat line, tram line, train line, underground line, time of jumping aboard, time of jumping off, leg duration, number of transport line stops, number of stop intervals, day of the week, calendar date.

37. The system of any of claims 31-36, configured to supply the determined usage information as embodied in a digital report or other data ensemble, wherein the report or other data ensemble covers usage data of also a number of other users active in the region during an analysis period such as the validity period of the token or a longer period spanning a plurality of token validity periods.

38. The system of claim 37, wherein said analysis period comprises one week or month.

39. The system of any of claims 31-38, wherein the determined usage information is provided by sending it in digital form or providing digital access thereto.

40. The system of any of claims 31-39, configured to establish and transmit the token in response to receiving a digital travel plan or a notification signal indicative of the user's current or forthcoming presence in the region.

41. The system of claim 40, wherein the token is transmitted by said terminal device of the user.

42. The system of any of claims 31-41, configured, in response to receiving a signal indicative of the user's stay within the region extending beyond the expiry of the token, to establish a new token with expiry farther away in the future or extend the expiry of the existing token to the user.

43. The system of any of claims 31-42, configured to provide a reply signal indicative of the user's subscription status in response to a receipt of a subscription validity query from a remote element.

44. The system of claim 43, wherein the remote element is the transport provider.

45. A mobility management arrangement comprising the device of any of claims 1-30 and the system of any of claims 31-44.

46. The mobility management arrangement of claim 45, further comprising the mobile verification apparatus.

47. A method (400) to be executed by an electronic mobile personal communication device carried by a user of the device while travelling in a region served by at least one transport provider, said method comprising:

receiving and storing a digital token containing digitally signed data and issued by a remote mobility management system trusted, by default, by the transport provider, said token being provided to the user as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited right to utilize the transport services within the region (406),

transmitting wireless signals including signals indicative of the times and corresponding locations of device to the management system to facilitate the system keeping track of the movement and related usage of transport services in the region by the user (408), indicating, responsive to a triggering event (410), the token including said digitally signed data wirelessly to a proximate verification apparatus to enable the verification apparatus to inspect the user's subscription as indicated by the token data and check the authenticity of the signature through the application of verification data associated with the system, and

determining, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

48. The method of claim 47, wherein said verification data is stored in the verification apparatus (412).

49. The method of claim 47, wherein the characteristic is determined based on a selected analysis period such as the validity period of the token or a selected reporting period.

50. A method (500) to be executed by an electronic system for providing digitally assisted personal mobility management service to users, wherein the system covers a number of different geographical regions and operates in liaison with transport providers offering passenger transport services in the regions, said system further being communication network accessible and comprising one or more at least functionally connected servers, said method comprising:

establishing a digitally signed token to a user carrying an electronic mobile personal communication device for use as a digital proof of the user's subscription to the system, wherein the token exhibits temporally limited default right to utilize the transport services offered by at least one transport provider within a region of said number of regions (504, 506),

transmitting said digitally signed token to the device of the user (508),

providing verification data to the transport provider, to enable checking the authenticity of the signature (518),

receiving signals transmitted by and/or at least regarding the device, including signals indicative of the times and corresponding locations of the device (510),

determining based on the received signals information characterizing the usage of the transport services by at least said user within the region during the validity of the token (512),

supplying the determined usage information to the transport provider for analysis, verification, and/or billing purposes (514),

determining, based on the location data and transport mode data received or derived based on the data such as inertial sensor data, at least one characteristic regarding the user's usage of the transport services, said characteristic being selected from the group consisting of: used transport lines, used bus line, used boat or other waterborne vessel line, used tram line, used train line, used airborne connection, used private car or taxicab leg, the used transport modes, number of modes used, number of transport lines used, number of times a transport line used, aggregate duration of transport line used, aggregate duration of transport mode used, distance of travel, number of transport line stop intervals travelled, and transport zones visited.

51. The method of claim 50, wherein the characteristic is determined based on a selected analysis period such as the validity period of the token or a selected reporting period,

52. A computer program comprising code means adapted, when run on a computer, to execute the method items of claim 47 or 50.

53. A non-transitory carrier medium comprising the program of claim 52.