different possible message sizes of the one or more data components of the periodic data. A receiver of the vehicular mobile terminal receives from the radio base station a plurality of semi-persistent radio resource configurations configured by the radio base station based on the transmitted information on the periodic data. Each of the plurality of semi-persistent radio resource configurations is configured for being usable to transmit at least one of the supported data components. The transmitter then indicates to the radio base station that one or more of the data components are to be transmitted by the vehicular mobile terminal. The receiver receives from the radio base station an activation command to activate one or more of the plurality of semi-persistent radio resource configurations to periodically allocate radio resources for the vehicular mobile terminal to transmit each of the data components. The transmitter then transmits the one or more data components to the one or more receiving entities based on the radio resources and the transmission periodicity as configured by the activated one or more semi-persistent radio resource configurations.

Correspondingly, in one general first aspect, the techniques disclosed here feature a radio base station for allocating radio resources to a vehicular mobile terminal for transmitting periodic data to one or more receiving entities. The vehicular mobile terminal supports transmission of the periodic data comprising one or more different data components to be transmitted with different possible transmission periodicities and/or different possible message sizes. A receiver of the radio base station receives from the vehicular mobile terminal information on the periodic data to be transmitted by the vehicular mobile terminal to the one or more receiving entities. A processor of the radio base station determines the different supported data components and the different possible transmission periodicities and/or the different possible message sizes of the one or more data components. The processor configures a plurality of semi-persistent radio resource configurations based on the determined transmission periodicities and/or on the determined message size. Each of the plurality of semi-persistent radio resource configurations is configured for being usable to transmit at least one of the supported data components. A transmitter of the radio base station transmits information on the configured plurality of semi-persistent radio resource configurations to the vehicular mobile terminal. The receiver receives, from the vehicular mobile terminal, an indication that one or more of the data components are to be transmitted by the vehicular mobile terminal. The processor then selects one or more among the plurality of semi-persistent radio resource configurations to be activated for the vehicular mobile terminal to periodically allocate radio resources for the vehicular mobile terminal to transmit each of the data components. The transmitter further configured to transmit an activation command to the vehicular mobile terminal to activate the selected one or more semi-persistent radio resource configurations for the vehicular mobile terminal.

CLAIMS

1. A vehicular mobile terminal for transmitting periodic data to one or more receiving entities, wherein the vehicular mobile terminal supports transmission of the periodic data comprising one or more different data components to be transmitted with different possible transmission periodicities and/or different possible message sizes, wherein the vehicular mobile terminal comprises:

a transmitter configured to transmit information on the periodic data to a radio base station responsible for allocating radio resources to the vehicular mobile terminal, the transmitted information on the periodic data allowing the radio base station to determine the different possible transmission periodicities and/or the different possible message sizes of the one or more data components of the periodic data,

a receiver configured to receive from the radio base station a plurality of semi-persistent radio resource configurations configured by the radio base station based on the transmitted information on the periodic data, each of the plurality of semi-persistent radio resource configurations being configured for being usable to transmit at least one of the supported data components,

the transmitter further configured to indicate to the radio base station that one or more of the data components are to be transmitted by the vehicular mobile terminal,

the receiver further configured to receive from the radio base station an activation command to activate one or more of the plurality of semi-persistent radio resource configurations to periodically allocate radio resources for the vehicular mobile terminal to transmit each of the data components, and

the transmitter further configured to transmit the one or more data components to the one or more receiving entities based on the radio resources and the transmission periodicity as configured by the activated one or more semi-persistent radio resource configurations.

2. The vehicular mobile terminal according to claim 1, wherein the transmitted information on the periodic data comprises:

information on part or all of the different possible transmission periodicities and/or different possible message sizes of the one or more data components, optionally wherein the information on a message size of at least one data component to be transmitted by the vehicular mobile terminal is transmitted by

the vehicular mobile terminal together with a buffer status report that indicates that data is pending to be transmitted for the one data component, or

information on the different data components, allowing the radio base station to determine the different possible transmission periodicities and/or the different possible message sizes based on the received information on the different possible data components.

3. The vehicular mobile terminal according to claim 1 or 2, wherein the transmitter is further configured to transmit information on vehicle parameters indicating vehicle dynamics including at least speed, supported by the vehicular mobile terminal to the radio base station, the information on the vehicle parameters being usable by the radio base station to determine the different possible transmission periodicities of the one or more supported data components, and

the transmitter is further configured to transmit to the radio base station information on the vehicle parameters currently experienced by the vehicular mobile terminal, wherein the information on the vehicle parameters currently experienced is usable by the radio base station to select the one or more of the plurality of semi-persistent radio resource configurations to activate, optionally wherein the information on the current vehicle parameters is transmitted together with the indication that one or more data components are to be transmitted by the vehicular mobile terminal.

4. The vehicular mobile terminal according to claim 3, wherein when one of the vehicle parameters changes more than a predetermined threshold, the transmitter is further configured to transmit information on the changed vehicle parameters to the radio base station, and the receiver is adapted to receive from the radio base station in return a further activation command to activate other semi-persistent radio resource configurations instead of the previously-activated semi-persistent radio resource configurations, or

when one of the vehicle parameters changes more than a predetermined threshold, the transmitter is further configured to request to the radio base station to activate other semi-persistent radio resource configurations than the previously-activated semi-persistent radio resource configurations, and the receiver is adapted to receive from the radio base station in return a further activation command to activate the other requested semi-persistent radio resource configurations instead of the previously-activated semi-persistent radio resource configurations, and

wherein the transmitter is further configured to transmit the one or more data components based on the radio resources and the transmission periodicity as configured by the activated other semi-persistent radio resource configurations,

optionally wherein the further activation command is received in a message via the PDCCH, Physical Downlink Control Channel.

5. The vehicular mobile terminal according to one of claims 1 to 4, wherein the information on the periodic data is transmitted within one message, or

wherein the information on the periodic data is transmitted within at least two separate messages, optionally wherein information on the different possible periodicities of the one or more supported data components is transmitted within a first message and information on a message size of at least one data component to be transmitted by the vehicular mobile terminal is transmitted by the vehicular mobile terminal together with a buffer status report indicating that data of the one data component is pending for transmission.

6. The vehicular mobile terminal according to one of claims 1 to 5, wherein each of the received plurality of semi-persistent radio resource configurations identifies:

radio resources and a periodicity suitable for transmitting at least one of the supported data components, optionally wherein the plurality of semi-persistent radio resource configurations are received in a message of the Radio Resource Control, RRC, protocol, or

a periodicity for transmitting at least one of the data components, and wherein information on the radio resources usable by the vehicular mobile terminal to transmit at least one of the data components is received together with the activation command to activate one or more of the plurality of semi-persistent radio resource configurations, optionally wherein the activation command and the information on the radio resources are received in a message via the PDCCH, Physical Downlink Control Channel.

7. The vehicular mobile terminal according to one of claims 1 to 6, wherein the data components, to be transmitted at the same time instance, are either transmitted as one message or as separate messages.

8. The vehicular mobile terminal according to one of claims 1 to 7, wherein the receiving entities comprise other vehicular or non-vehicular mobile terminals and the periodic

data being transmitted via a sidelink connection, and/or the receiving entities comprise the radio base station and the periodic data being transmitted via a radio connection.

9. The vehicular mobile terminal according to one of claims 1 to 8, wherein the plurality of semi-persistent radio resource configurations are configured such that there is one semi-persistent radio resource configuration for each data component with a specific message size and a specific transmission periodicity, or

wherein the data components, transmitted at the same time instance, are transmitted as one message, and the plurality of semi-persistent radio resource configurations are configured such that there is one semi-persistent radio resource configuration for each possible message comprising one or more of the data components to be transmitted by the vehicular mobile terminal, optionally wherein the transmitter is configured to transmit the message comprising the one or more data components based on the activated semi-persistent radio resource configuration corresponding to the comprised data components of the message to be transmitted.

10. A radio base station for allocating radio resources to a vehicular mobile terminal for transmitting periodic data to one or more receiving entities, wherein the vehicular mobile terminal supports transmission of the periodic data comprising one or more different data components to be transmitted with different possible transmission periodicities and/or different possible message sizes, wherein the radio base station comprises:

a receiver configured to receive from the vehicular mobile terminal information on the periodic data to be transmitted by the vehicular mobile terminal to the one or more receiving entities,

a processor configured to determine the different supported data components and the different possible transmission periodicities and/or the different possible message sizes of the one or more data components,

the processor configured to configure a plurality of semi-persistent radio resource configurations based on the determined transmission periodicities and/or on the determined message sizes, wherein each of the plurality of semi-persistent radio resource configurations is configured for being usable to transmit at least one of the supported data components,

a transmitter configured to transmit information on the configured plurality of semi-persistent radio resource configurations to the vehicular mobile terminal,

the receiver further configured to receive, from the vehicular mobile terminal, an indication that one or more of the data components are to be transmitted by the vehicular mobile terminal,

the processor further configured to select one or more among the plurality of semi-persistent radio resource configurations to be activated for the vehicular mobile terminal to periodically allocate radio resources for the vehicular mobile terminal to transmit each of the data components, and

the transmitter further configured to transmit an activation command to the vehicular mobile terminal to activate the selected one or more semi-persistent radio resource configurations for the vehicular mobile terminal.

11. The radio base station according to claim 10, wherein the received information on the periodic data comprises:

information on part or all of the different possible transmission periodicities and/or different possible message sizes of the one or more data components, optionally wherein the information on a message size of at least one data component to be transmitted by the vehicular mobile terminal is received from the vehicular mobile terminal together with a buffer status report that indicates that data is pending to be transmitted for the one data component, or

information on the different data components, wherein the processor is further configured to determine the different possible transmission periodicities and/or the different possible message sizes based on the received information on the different possible data components.

12. The radio base station according to claim 10 or 11, wherein the receiver is further configured to receive from the vehicular mobile terminal information on vehicle parameters indicating vehicle dynamics including at least speed, supported by the vehicular mobile terminal, wherein the processor is further configured to determine the different possible transmission periodicities of the one or more supported data components based on the receive information on the vehicle parameters, and

the receiver is further configured to receive from the vehicular mobile terminal information on the vehicle parameters currently experienced by the vehicular mobile

terminal, wherein the processor is further adapted to select the one or more among the plurality of semi-persistent radio resource configurations to activate based on the receive current vehicle parameters, optionally wherein the information on the current vehicle parameters is received from the vehicular mobile terminal together with the indication that one or more data component are to be transmitted by the vehicular mobile terminal.

13. The radio base station according to claim 12, wherein the receiver is adapted to receive information on changed vehicle parameters from the vehicular mobile terminal, and the processor is configured to select, based on the changed vehicle parameters, other semi-persistent radio resource configurations instead of the previously selected and activated semi-persistent radio resource configurations, and the transmitter is configured to transmit a further activation command to the vehicular mobile terminal to active the selected other semi-persistent radio resource configurations, or

wherein the receiver is adapted to receive a request from the vehicular mobile terminal to activate other semi-persistent radio resource configurations than the previously-activated semi-persistent radio resource configurations, the processor is configured to determine whether to activate the other semi-persistent radio resource configurations or not, and in the positive case, the transmitter is configured to transmit to the vehicular mobile terminal a further activation command to activate the other requested semi-persistent radio resource configurations instead of the previously-activated semi-persistent radio resource configurations,

optionally wherein the further activation command is transmitted in a message via the PDCCH, Physical Downlink Control Channel.

14. The radio base station according to one of claims 10 to 13, wherein each of the configured and transmitted plurality of semi-persistent radio resource configurations identifies:

radio resources and a periodicity suitable for transmitting at least one of the supported data components, optionally wherein the plurality of semi-persistent radio resource configurations are transmitted in a message of the Radio Resource Control, RRC, protocol, or

a periodicity for transmitting at least one of the data components, and wherein information on the radio resources usable by the vehicular mobile terminal to transmit at least one of the data components is transmitted by the transmitter

together with the activation command to activate one or more of the plurality of semi-persistent radio resource configurations, optionally wherein the activation command and the information on the radio resources are transmitted in a message via the PDCCH, Physical Downlink Control Channel.

15. The radio base station according to one of claims 10 to 14, wherein the plurality of semi-persistent radio resource configurations are configured such that there is one semi-persistent radio resource configuration for each data component with a specific message size and specific transmission periodicity, or

wherein the data components, transmitted by the vehicular mobile terminal at the same time instance, are transmitted as one message, and the plurality of semi-persistent radio resource configurations are configured such that there is one semi-persistent radio resource configuration for each possible message comprising one or more of the data components to be transmitted by the vehicular mobile terminal, such that the vehicular mobile terminal transmits the message comprising the one or more data components based on the activated semi-persistent radio resource configuration corresponding to the comprised data components of the message to be transmitted.