wireless communication device 200a performs wireless communications, via electromagnetic waves, with the onboard unit 10A installed in the vehicle A within a predetermined communicable area defined on a road surface of the lane L1. The wireless communication device 200b performs wireless communications, via electromagnetic waves, with the onboard unit 10A installed in the vehicle A within a range of a predetermined communication region defined on a road surface of the lane L2.

In the present embodiment, the wireless communication devices 200 (wireless communication devices 200a and 200b) employ Radio Frequency Identifier (RFID) communications to perform wireless communications with the onboard unit 10A.

[0028]

The charge processing device 210 is installed on the roadside of the lanes L1 and L2, and in the vicinity of the gantry G. The charge processing device 210 is in wired connection with the wireless communication device 200, and sends and receives the "charge processing data D1" to and from the onboard unit 10A via the wireless communication device 200. The charge processing device 210 calculates a charge amount for the onboard unit 10A, based on the "charge processing data D1" acquired from the onboard unit 10A, and executes the charge processing.

[0029]

(Functional Configuration of Toll Collection Facility)

Next, a functional configuration of the toll collection facility 20A according to the present embodiment is described with reference to FIG. 4 and FIG. 5.

FIG. 4 is a diagram illustrating a functional configuration of a toll collection facility according to the first embodiment of the present invention.

FIG. 5 is a diagram illustrating an example of scenario information according to the first embodiment of the present invention.

As illustrated in FIG. 4, the wireless communication device 200 of the toll collection facility 20A includes a wireless communication unit 201, a central processing unit (CPU), a recording medium (internal recording medium) 203, and a wired communication unit 204.

[0030]

The wireless communication unit 201 includes an RFID antenna 201a. The wireless communication unit 201 outputs electromagnetic waves to a communicable area of the wireless communication device 200, via the RFID antenna 201a, at a predetermined time interval. The wireless communication

scenario information D2 recorded in the recording medium 213 in advance, based on the tollgate including the toll collection facility 20A, a route of the toll road, and the like (step S101).

[0042]

Then, the scenario information generation unit 212a sends the scenario information D2 thus generated to the wireless communication device 200 via the wired communication unit 211 (step S102), and terminates the "processing P10 of sending scenario information".

[0043]

FIG. 8 is a second diagram illustrating a processing flow of the scenario information generation unit according to the first embodiment of the present invention.

Next, the "processing P11 of updating scenario information" executed by the charge processing device 210 when the scenario information D2 is changed is described in detail with reference to FIG. 8.

As illustrated in FIG. 8, the scenario information generation unit 212a generates scenario information by performing adding, changing, deleting, and the like of the new scenario information D2, through the unillustrated input device and the like of the charge processing device 210 (step S110). The scenario information generation unit 212a updates the scenario information D2 recorded in the recording medium 213 by overwriting the scenario information D2 with the new scenario information or adding the new scenario information to the scenario information D2.

[0044]

Next, the scenario information generation unit 212a sends the new scenario information to the wireless communication device 200 via the wired communication unit 211 (step S111), and terminates the "processing P11 of updating scenario information".

[0045]

FIG. 9 is a diagram illustrating a processing flow of a recording processing unit according to the first embodiment of the present invention.

The "processing P12 of recording scenario information" executed by the wireless communication device 200 of the toll collection facility 20A is described below with reference to FIG. 9.

As illustrated in FIG. 9, first of all, the recording processing unit 202a of the wireless communication device 200 determines whether the scenario information D2 has been received from the charge processing device 210 (step S120).

CLAIMS

1. A toll collection facility comprising:

a wireless communication device provided to a lane; and

a charge processing device configured to execute read processing and write processing, for charge processing data, on a communication target device installed in a vehicle traveling on the lane, via the wireless communication device, based on a predetermined processing procedure, wherein

the charge processing device includes a scenario information generation unit configured to generate and send scenario information indicating at least a part of the processing procedure, and

the wireless communication device includes

a recording processing unit configured to record the scenario information received from the charge processing device, in an internal recording medium, and

a scenario processing unit configured to execute read processing and write processing, for the charge processing data, on the communication target device, based on the scenario information recorded in the internal recording medium.

2. The toll collection facility according to claim 1, wherein the scenario information generation unit is configured to generate and send the scenario information when the charge processing device starts.

3. A toll collection system comprising:

the toll collection facility according to claim 1 or 2;

a wireless communication unit configured to wirelessly send and receive data;

a copy processing unit configured to read, when a card-type portable recording medium is inserted, charge processing data recorded in the card-type portable recording medium and copy the charge processing data in an internal recording medium;

a read processing unit configured to read and send, when a read command for the charge processing data is received via the wireless communication unit, the charge processing data copied in the internal recording medium;

a write processing unit configured to write, when a write command for new charge processing data is received via the wireless communication unit, the received new charge processing data to the internal recording medium; and

a card update unit configured to update, after the new charge processing data has been written to the internal recording medium, the charge processing data recorded in the card-type portable recording medium, based on the new charge processing data written to the internal recording medium.

4. The toll collection system according to claim 3, wherein

the toll collection facility includes the wireless communication device including: an upstream side wireless communication device provided on an upstream side on the lane; and a downstream side wireless communication device provided more on a downstream side on the lane than the upstream side wireless communication device, and

the charge processing device includes a charge result checking unit configured to determine that the write processing on the communication target device has failed to be correctly performed, when the charge processing data related to write processing on the communication target device executed by the upstream

side wireless communication device does not match the charge processing data related to read processing on the communication target device executed by the downstream side wireless communication device.

5. A toll collection method for executing read processing and write processing, for charge processing data, on a communication target device installed in a vehicle traveling on a lane based on a predetermined processing procedure, the toll collection method comprising:

generating and sending scenario information indicating at least a part of the processing procedure;

recording the scenario information in an internal recording medium; and

executing read processing and write processing, for the charge processing data, on the communication target device, based on the scenario information recorded in the internal recording medium.