

{CLAIMS}

{Claim 1}

An information processing device comprising:

receiving means for receiving positional information from
5 a plurality of vehicles, the positional information indicating
the position of each vehicle; and

calculating means for calculating a route and a distance
traveled by a vehicle corresponding to the positional
information received by the receiving means by performing an
10 averaging process on the received positional information using
the positional information of another vehicle.

{Claim 2}

The information processing device according to Claim 1,
further comprising storage means for storing the positional
15 information received by the receiving means for each vehicle
and each predetermined area that corresponds to the position
indicated by the positional information,

wherein the calculating means performs the averaging
process on the positional information received by the
20 receiving means by using the positional information of the
other vehicle, stored in the storage means, in the area
corresponding to the positional information.

{Claim 3}

The information processing device according to Claim 1 or

25 2, wherein the positional information is generated on the

basis of a global-positioning-system signal transmitted from a global-positioning-system satellite, and

wherein the positional information of the other vehicle used for the averaging process by the calculating means

5 includes positional information generated within a predetermined time period in which an effect of an error occurring due to the state of the global-positioning-system signal transmitted from the global-positioning-system satellite is minimized.

10 {Claim 4}

The information processing device according to any one of Claims 1 to 3, wherein the positional information is generated on the basis of a global-positioning-system signal transmitted from a global-positioning-system satellite,

15 wherein the information processing device further comprises:

second storage means for storing global-positioning-system base station information indicating a set position of a global-positioning-system base station that receives the
20 global-positioning-system signal; and

correcting means for obtaining a difference on the basis of a signal transmitted from the global-positioning-system base station and the global-positioning-system base station information stored in the second storage means so as to

25 correct the positional information received by the receiving

means on the basis of the difference, and

wherein the calculating means calculates the route and the distance traveled by the vehicle corresponding to the received positional information by performing the averaging
5 process on the corrected positional information using the positional information of the other vehicle.

{Claim 5}

The information processing device according to Claim 4,
wherein the global-positioning-system base station includes a
10 plurality of global-positioning-system base stations respectively provided in a plurality of predetermined correction areas, and

wherein the correcting means corrects positional information included in each correction area using the
15 difference based on the signal transmitted from the global-positioning-system base station provided in the correction area.

{Claim 6}

A toll collection system comprising:

20 an on-board device that is installed in a vehicle and that generates and transmits positional information indicating the position of the vehicle; and

the information processing device according to any one of Claims 1 to 5.

25 {Claim 7}

A toll collection method of an information processing device including storage means for storing toll-area information indicating an area where a toll is charged to vehicles, and receiving means for receiving positional
5 information from a plurality of vehicles, the positional information indicating the position of each vehicle, the method comprising:

a first step of calculating a route and a distance traveled by a vehicle corresponding to the positional
10 information received by the receiving means by performing an averaging process on the received positional information using the positional information of another vehicle; and

a second step of charging the toll to the vehicle on the basis of the traveled distance calculated in the first step

15 and the toll area information stored in the storage means.

{CLAIMS}

{Claim 1}

An information processing device comprising:

receiving means for receiving positional information

5 from a plurality of vehicles, the positional information
indicating the position of each vehicle; and

calculating means for calculating a route and a distance
traveled by a vehicle corresponding to the positional
information received by the receiving means by performing an
10 averaging process on the received positional information
using the positional information of another vehicle.

{Claim 2}

The information processing device according to Claim 1,
further comprising storage means for storing the positional
15 information received by the receiving means for each vehicle
and each predetermined area that corresponds to the position
indicated by the positional information,

wherein the calculating means is configured to perform
the averaging process on the positional information received
20 by the receiving means by using the positional information of
the other vehicle, stored in the storage means, in the area
corresponding to the positional information.

{Claim 3}

The information processing device according to Claim 1
25 or 2, configured to generate the positional information on

the basis of a global-positioning-system signal transmitted from a global-positioning-system satellite, and

wherein the calculating means is configured to use the positional information of the other vehicle for the averaging process including positional information generated within a predetermined time period in which an effect of an error occurring due to the state of the global-positioning-system signal transmitted from the global-positioning-system satellite is minimized.

{Claim 4}

The information processing device according to any one of Claims 1 to 3, configured for the positional information to be generated on the basis of a global-positioning-system signal transmitted from a global-positioning-system satellite,

wherein the information processing device further comprises:

second storage means for storing global-positioning-system base station information indicating a set position of a global-positioning-system base station configured to receive the global-positioning-system signal; and

correcting means for obtaining a difference on the basis of a signal transmitted from the global-positioning-system base station and the global-positioning-system base station information stored in the second storage means so as to

correct the positional information received by the receiving means on the basis of the difference, and

wherein the calculating means is configured to calculate the route and the distance traveled by the vehicle

5 corresponding to the received positional information by performing the averaging process on the corrected positional information using the positional information of the other vehicle.

{Claim 5}

10 The information processing device according to Claim 4, wherein the global-positioning-system base station includes a plurality of global-positioning-system base stations respectively provided in a plurality of predetermined correction areas, and

15 wherein the correcting means is configured to correct positional information included in each correction area using the difference based on the signal transmitted from the global-positioning-system base station provided in the correction area.

20 {Claim 6}

A toll collection system comprising:

an on-board device configured to be installed in a vehicle and configured to generate and transmit positional information indicating the position of the vehicle; and

25 the information processing device according to any one

of Claims 1 to 5.

{Claim 7}

A toll collection method of an information processing device including storage means for storing toll-area

5 information indicating an area where a toll is charged to vehicles, and receiving means for receiving positional information from a plurality of vehicles, the positional information indicating the position of each vehicle, the method comprising:

10 a first step of calculating a route and a distance traveled by a vehicle corresponding to the positional information received by the receiving means by performing an averaging process on the received positional information using the positional information of another vehicle; and

15 a second step of charging the toll to the vehicle on the basis of the traveled distance calculated in the first step and the toll-area information stored in the storage means.