CLAIMS

1. An anomalous-vehicle extraction device comprising:

a traffic state value calculation unit that is configured to calculate a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle; and

an anomalous-vehicle extraction unit that is configured to extract the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated by the traffic state value calculation unit, and the vehicle information acquired from the on-board unit of each vehicle,

wherein the anomalous-vehicle extraction unit is configured to acquire a speed within the target area and a density of vehicles within the target area as the traffic state value calculated by the traffic state value calculation unit, and determine that the traveling conditions of the vehicle are anomalous in a case where the density of vehicles within the target area is higher than a threshold and an amount of deviation between the speed within the target area and the traveling speed of the vehicle indicated by the vehicle information exceeds a predetermined allowable range.

2. The anomalous-vehicle extraction device according to claim 1, further comprising a traveling speed calculation unit that is configured to calculate the traveling speed of the vehicle on the basis of position information of at least two points of the vehicle indicated by the vehicle information acquired from the same on-board unit at different timings,

wherein the anomalous-vehicle extraction unit is configured to determine whether the traveling conditions of the vehicle indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traveling speed calculated by the traveling speed calculation unit.

3. The anomalous-vehicle extraction device according to claim 1 or 2, further comprising a notification unit that is configured to give notice of the vehicle determined to be anomalous by the anomalous-vehicle extraction unit.

4. The anomalous-vehicle extraction device according to any one of claims 1 to 3, further comprising a correction unit that is configured to generate information for correcting a billing status regarding the vehicle determined to be anomalous by the anomalous-vehicle extraction unit.

5. An anomalous-vehicle extraction device comprising:

a traffic state value calculation unit that is configured to calculate a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle;

an anomalous-vehicle extraction unit that is configured to extract the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated by the traffic state value calculation unit, and the vehicle information acquired from the on-board unit of each vehicle; and

a traffic state estimation unit that is configured to estimate the state of traffic within the predetermined target area in the predetermined target time period, in a case where a

density of the vehicle information within the predetermined target area in the predetermined target time period is less than a threshold,

wherein the traffic state value calculation unit is configured to calculate the traffic state value in a case where the density of the vehicle information is equal to or greater than the threshold, and

the anomalous-vehicle extraction unit is configured to determine whether the traveling conditions of the vehicle indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the state of traffic estimated by the traffic state estimation unit.

6. The anomalous-vehicle extraction device according to claim 5, further comprising a notification unit that is configured to give notice of the vehicle determined to be anomalous by the anomalous-vehicle extraction unit.

7. The anomalous-vehicle extraction device according to claim 5 or 6, further comprising a correction unit that is configured to generate information for correcting a billing status regarding the vehicle determined to be anomalous by the anomalous-vehicle extraction unit.

8. An anomalous-vehicle extraction method comprising:

a traffic state value calculation step of calculating a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle; and

an anomalous-vehicle extraction step of extracting the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated in the traffic state value calculation step, and the vehicle information acquired from the on-board unit of each vehicle,

wherein the anomalous-vehicle extraction step comprises a step of acquiring a speed within the target area and a density of vehicles within the target area as the traffic state value calculated by the traffic state value calculation unit, and determining that the traveling conditions of the vehicle are anomalous in a case where the density of vehicles within the target area is higher than a threshold and an amount of deviation between the speed within the target area and the traveling speed of the vehicle indicated by the vehicle information exceeds a predetermined allowable range.

9. A program causing a computer to function as:

traffic state value calculation unit for calculating a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle; and

anomalous-vehicle extraction unit for extracting the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated by the traffic state value calculation unit, and the vehicle information acquired from the on-board unit of each vehicle,

wherein the anomalous-vehicle extraction unit is configured to acquire a speed within the target area and a density of vehicles within the target area as the traffic state value calculated by the traffic state value calculation unit, and determine that the traveling conditions of the vehicle are anomalous in a case where the density of vehicles within the target area is higher than a threshold and an amount of deviation between the speed within the

target area and the traveling speed of the vehicle indicated by the vehicle information exceeds a predetermined allowable range.

10. An anomalous-vehicle extraction method comprising:

a traffic state value calculation step of calculating a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle;

an anomalous-vehicle extraction step of extracting the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated in the traffic state value calculation step, and the vehicle information acquired from the on-board unit of each vehicle; and

a traffic state estimation step of estimating the state of traffic within the predetermined target area in the predetermined target time period, in a case where a density of the vehicle information within the predetermined target area in the predetermined target time period is less than a threshold,

wherein the traffic state value calculation step comprises a step of calculating the traffic state value in a case where the density of the vehicle information is equal to or greater than the threshold, and

the anomalous-vehicle extraction step comprises a step of determining whether the traveling conditions of the vehicle indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the state of traffic estimated in the traffic state estimation step.

11. A program causing a computer to function as:

traffic state value calculation unit for calculating a traffic state value indicating a state of traffic within a predetermined target area in a predetermined target time period, on the basis of vehicle information indicating a position and a traveling speed of a vehicle which are acquired from an on-board unit mounted in the vehicle;

anomalous-vehicle extraction unit for extracting the vehicle of which traveling conditions indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the traffic state value calculated by the traffic state value calculation unit, and the vehicle information acquired from the on-board unit of each vehicle; and

traffic state estimation unit for estimating the state of traffic within the predetermined target area in the predetermined target time period, in a case where a density of the vehicle information within the predetermined target area in the predetermined target time period is less than a threshold,

wherein the traffic state value calculation unit is configured to calculate the traffic state value in a case where the density of the vehicle information is equal to or greater than the threshold, and

the anomalous-vehicle extraction unit is configured to determine whether the traveling conditions of the vehicle indicated by the vehicle information are anomalous as the vehicle traveling within the target area, on the basis of the state of traffic estimated by the traffic state estimation unit.