[CLAIMS]

[Claim 1]

An on-board device comprising a control unit configured to:

calculate vehicle information of a host vehicle in a vehicle information area which the host vehicle enters before the host vehicle enters a transmission on-board device determination area in which an on-board device that is to transmit vehicle information of a vehicle in which the on-board device is mounted to a center is determined;

determine whether the host vehicle has entered the transmission on-board device determination area, and request communication from an on-board device mounted in an other vehicle by transmitting a request when the host vehicle is determined to have been entered the transmission on-board device determination area;

determine whether a representative vehicle condition in the transmission on-board device determination area has been satisfied;

receive vehicle information of the other vehicle from the other on-board device not satisfying the representative vehicle condition in the transmission on-board device determination area by performing vehicle-to-vehicle communication which is performed between the host vehicle and the other vehicle when the vehicle-to-vehicle communication has been established by receiving a response to the request after the representative vehicle condition has been satisfied;

transmit the vehicle information of the host vehicle to the other on-board device satisfying the representative vehicle condition by performing the vehicle-to-vehicle communication when the vehicle-to-vehicle communication has been established by receiving the response to the request before the representative vehicle condition in the transmission on-board device determination area is satisfied; and

transmit the vehicle information of the host vehicle and the vehicle information of the other vehicle received from the other on-board device to the center configured to acquire the vehicle information after the determination that the representative vehicle condition has been satisfied,

wherein the representative vehicle condition is a condition that the control unit has not transmitted the vehicle information of the host vehicle to the other on-board device until crossing a boundary position set in the transmission on-board device determination area.

[Claim 2]

The on-board device according to claim 1, wherein the control unit is configured to set a transmission/reception state indicating a state in which transmission of the vehicle information of the host vehicle is performed or a state in which reception of the vehicle information of the other vehicle is performed to a first state in which the representative vehicle condition is not satisfied when the host vehicle has entered the transmission on-board device determination area,

wherein the control unit is configured to set the transmission/reception state to a second state in which the representative vehicle condition is not satisfied when the vehicle information of the host vehicle has been transmitted to the other on-board device satisfying the representative vehicle condition before the representative vehicle condition has been satisfied,

wherein the control unit is configured to set the boundary position at which the transmission/reception state is changed in the transmission on-board device determination area and set the transmission/reception state to a third state in which the representative vehicle condition is satisfied when the set boundary position is crossed and the transmission/reception state is the first state, and

wherein the control unit is configured to transmit information indicating the transmission/reception state to the other on-board device in correlation with the vehicle information of the host vehicle.

[Claim 3]

The on-board device according to claim 1 or 2, wherein the control unit is configured not to receive information from an area other than the transmission on-board device determination area in which the host vehicle in which the on-board device of the host vehicle

is mounted is traveling on the basis of information on the transmission on-board device determination area included in a signal transmitted from the other on-board device when the vehicle-to-vehicle communication with the other on-board device is performed.

[Claim 4]

The on-board device according to any one of claims 1 to 3, wherein the control unit is configured not to request communication from the on-board device mounted in the other vehicle when the host vehicle in which the on-board device of the host vehicle is mounted is stopped.

[Claim 5]

The on-board device according to any one of claims 1 to 4, wherein the control unit is configured to transmit information indicating a first vehicle information area in which the vehicle information of the host vehicle is calculated to the other on-board device in correlation with the vehicle information of the host vehicle, and

wherein the control unit is configured not to receive the vehicle information from a vehicle information area other than the first vehicle information area when the vehicle-to-vehicle communication with the other on-board device is performed.

[Claim 6]

A communication method of an on-board device, comprising:

causing a control unit to calculate vehicle information of a host vehicle in a vehicle information area which the host vehicle enters before the host vehicle enters a transmission on-board device determination area in which an on-board device that is to transmit vehicle information of a vehicle in which the on-board device is mounted to a center is determined;

causing the control unit to determine whether the host vehicle has entered the transmission on-board device determination area, and request communication from an on-

board device mounted in an other vehicle by transmitting a request when the host vehicle is determined to have been entered the transmission on-board device determination area;

causing the control unit to determine whether a representative vehicle condition in the transmission on-board device determination area has been satisfied;

causing the control unit to receive vehicle information of the other vehicle from the other on-board device not satisfying the representative vehicle condition in the transmission on-board device determination area by performing vehicle-to-vehicle communication which is performed between the host vehicle and the other vehicle when the vehicle-to-vehicle communication has been established by receiving a response to the request after the representative vehicle condition has been satisfied;

causing the control unit to transmit the vehicle information of the host vehicle to the other on-board device satisfying the representative vehicle condition by performing the vehicle-to-vehicle communication when the vehicle-to-vehicle communication has been established by receiving the response to the request before the representative vehicle condition in the transmission on-board device determination area is satisfied; and

causing the control unit to transmit the vehicle information of the host vehicle and the vehicle information of the other vehicle received from the other on-board device to the center configured to acquire the vehicle information after the determination that the representative vehicle condition in the transmission on-board device determination area has been satisfied,

wherein the representative vehicle condition is a condition that the control unit has not transmitted the vehicle information of the host vehicle to the other on-board device until crossing a boundary position set in the transmission on-board device determination area.

[Claim 7]

A program causing a computer of an on-board device which is mounted in a vehicle to perform:

a step of calculating vehicle information of a host vehicle in a vehicle information area which the host vehicle enters before the host vehicle enters a transmission on-board

device determination area in which an on-board device that is to transmit vehicle information of a vehicle in which the on-board device is mounted to a center is determined;

a step of determining whether the host vehicle has entered the transmission on-board device determination area, and requesting communication from an on-board device mounted in an other vehicle by transmitting a request when the host vehicle is determined to have been entered the transmission on-board device determination area;

a step of determining whether a representative vehicle condition in the transmission on-board device determination area has been satisfied;

a step of receiving vehicle information of the other vehicle from the other on-board device not satisfying the representative vehicle condition in the transmission on-board device determination area by performing vehicle-to-vehicle communication which is performed between the host vehicle and the other vehicle when the vehicle-to-vehicle communication has been established by receiving a response to the request after the representative vehicle condition has been satisfied;

a step of transmitting the vehicle information of the host vehicle to the other on-board device satisfying the representative vehicle condition by performing the vehicle-to-vehicle communication when the vehicle-to-vehicle communication has been established by receiving the response to the request before the representative vehicle condition in the transmission on-board device determination area is satisfied; and

a step of transmitting the vehicle information of the host vehicle and the vehicle information of the other vehicle received from the other on-board device to the center configured to acquire the vehicle information after the determination that the representative vehicle condition in the transmission on-board device determination area has been satisfied,

wherein the representative vehicle condition is a condition that the computer has not transmitted the vehicle information of the host vehicle to the other on-board device until crossing a boundary position set in the transmission on-board device determination area.