What is claimed is:

1. A position notification apparatus that notifies an onboard unit mounted in a vehicle of a present position of the vehicle, comprising:

a detection unit that detects the vehicle;

a detection time recording unit that records a detection time at which the detection unit has detected the vehicle in a detection time queue;

an output unit that extracts the detection time from the detection time queue when the onboard unit mounted in the vehicle enters a communication range; and

a notification unit that notifies the onboard unit mounted in the vehicle of a detection time extracted by the output unit and a correction reference position that is a position corrected as a position at which the vehicle has been present at the detection time by wireless communication.

2. The position notification apparatus according to claim 1,

wherein the detection unit detects a vehicle present behind a boundary of a communication range of wireless communication by the notification unit in a vehicle travel direction.

3. The position notification apparatus according to claim 1 or 2,

wherein the detection unit detects a vehicle present near the boundary of the communication range of wireless communication by the notification unit.

4. The position notification apparatus according to any one of claims 1 to 3,

wherein the detection unit detects the onboard unit mounted in the vehicle present in a predetermined detection area based on reflected light of laser light emitted to the detection area by a laser sensor installed above a road surface, and

the notification unit notifies the onboard unit of the detection time at which the detection unit has detected the onboard unit mounted in the vehicle by wireless communication.

5. An onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification apparatus

according to any one of claims 1 to 4, comprising:

a calculation unit that calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information;

a receiver unit that receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

6. A vehicle position calculation system that calculates a position at which a vehicle is present, comprising:

an onboard unit that calculates the position at which the vehicle having the onboard unit mounted therein is present; and

a position notification apparatus that notifies the onboard unit of a present position of the vehicle in which the onboard unit is mounted,

wherein the position notification apparatus includes:

a detection unit that detects the vehicle;

a detection time recording unit that records a detection time at which the detection unit has detected the vehicle in a detection time queue;

an output unit that extracts the detection time from the detection time queue when the onboard unit mounted in the vehicle enters a communication range; and

a notification unit that notifies the onboard unit mounted in the vehicle of a detection time extracted by the output unit and a correction reference position that is a position corrected as a position at which the vehicle has been present at the detection time by wireless communication, and

the onboard unit includes:

a calculation unit that calculates a position at which the vehicle having the onboard unit mounted therein is present each time based on a distance traveled by the vehicle and records the position on a storage unit as travel history information;

a receiver unit that receives the detection time at which the vehicle has been detected

by the position notification apparatus and the correction reference position that is a position to be corrected as the position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

7. A vehicle position notification method using a position notification apparatus that notifies an onboard unit mounted in a vehicle of a present position of the vehicle,

wherein a detection unit detects the vehicle,

a detection time recording unit records a detection time at which the detection unit has detected the vehicle in a detection time queue,

an output unit extracts the detection time from the detection time queue when the onboard unit mounted in the vehicle enters a communication range, and

a notification unit notifies the onboard unit mounted in the vehicle of a detection time extracted by the output unit and a correction reference position that is a position corrected as a position at which the vehicle has been present at the detection time by wireless communication.

8. A vehicle position calculation method using an onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification apparatus according to any one of claims 1 to 4,

wherein a calculation unit calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information,

a receiver unit receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication, and

a correction unit corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

9. A program for causing an onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification apparatus according to any one of claims 1 to 4 to function as:

a calculation unit that calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information;

a receiver unit that receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

What is claimed is:

1. A position notification apparatus comprising:

a detection unit that detects a plurality of vehicles;

a detection time recording unit that records a detection time in a detection time queue, each time when the detection unit detects one of the plurality of vehicles;

an output unit that reads the detection time initially recorded in the detection time queue and erases the detection time initially recorded from the detection time queue, each time when an onboard unit mounted in one vehicle enters a communication range, the one vehicle being one of the plurality of vehicles; and

a notification unit that notifies the onboard unit mounted in the one vehicle of the read detection time and a correction reference position that is a position corrected as a position at which the one vehicle has been present at the detection time by wireless communication.

2. The position notification apparatus according to claim 1,

wherein the detection unit detects the plurality of vehicles present behind a boundary of a communication range of wireless communication by the notification unit in a vehicle travel direction.

3. The position notification apparatus according to claim 1 or 2,

wherein the detection unit detects the plurality of vehicles present near the boundary of the communication range of wireless communication by the notification unit.

4. The position notification apparatus according to any one of claims 1 to 3,

wherein the detection unit detects the onboard unit present in a predetermined detection area based on reflected light of laser light emitted to the detection area by a laser sensor installed above a road surface, and

the notification unit notifies the onboard unit of the detection time at which the detection unit has detected the onboard unit by wireless communication.

5. An onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification

apparatus according to any one of claims 1 to 4, comprising:

a calculation unit that calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information;

a receiver unit that receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

6. A vehicle position calculation system, comprising:

an onboard unit that calculates a position at which one vehicle having the onboard unit mounted therein is present, the one vehicle being one of a plurality of vehicles; and

a position notification apparatus that notifies the onboard unit of a present position of the one vehicle,

wherein the position notification apparatus includes:

a detection unit that detects the plurality of vehicles;

a detection time recording unit that records a detection time in a detection time queue, each time when the detection unit detects one of the plurality of vehicles;

an output unit that reads the detection time initially recorded in the detection time queue and erases the detection time initially recorded from the detection time queue, each time when the onboard unit mounted in the one vehicle enters a communication range; and

a notification unit that notifies the onboard unit mounted in the one vehicle of the read-detection time and a correction reference position that is a position corrected as a position at which the one vehicle has been present at the detection time by wireless communication, and

the onboard unit includes:

a calculation unit that calculates a position at which the one vehicle having the onboard unit mounted therein is present each time based on a distance traveled by

the one vehicle and records the position on a storage unit as travel history information;

a receiver unit that receives the detection time at which the one vehicle has been detected by the position notification apparatus and the correction reference position that is a position to be corrected as the position at which the one vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the one vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

7. A vehicle position notification method using a position notification apparatus,

wherein a detection unit detects a plurality of vehicles,

a detection time recording unit records a detection time in a detection time queue, each time when the detection unit detects one of the plurality of vehicles,

an output unit reads the detection time initially recorded in the detection time queue and erases the detection time initially recorded from the detection time queue, each time when an onboard unit mounted in one vehicle enters a communication range, the one vehicle being one of the plurality of vehicle, and

a notification unit notifies the onboard unit mounted in the one vehicle of the read detection time and a correction reference position that is a position corrected as a position at which the one vehicle has been present at the detection time by wireless communication.

8. A vehicle position calculation method using an onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification apparatus according to any one of claims 1 to 4,

wherein a calculation unit calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information,

a receiver unit receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the

detection time from the position notification apparatus by wireless communication, and

a correction unit corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.

9. A program for causing an onboard unit that is mounted in a vehicle and calculates a position at which the vehicle is present based on information notified of by the position notification apparatus according to any one of claims 1 to 4 to function as:

a calculation unit that calculates a position at which the vehicle is present each time based on a distance traveled by the vehicle, and records the position on a storage unit as travel history information;

a receiver unit that receives a detection time at which the vehicle has been detected by the position notification apparatus and a correction reference position that is a position to be corrected as a position at which the vehicle has been present at the detection time from the position notification apparatus by wireless communication; and

a correction unit that corrects the position at which the vehicle is present based on a travel history from the detection time to a current time stored on the storage unit and the correction reference position.