CLAIMS

1. An autonomous driving system (100; 200; 300; 400; 500) that performs autonomous driving of a vehicle, the autonomous driving system characterized by comprising:

a vehicle position acquisition device (11) configured to acquire a position of the vehicle on a map;

a vehicle state acquisition device (13) configured to acquire a vehicle state of the vehicle;

an occupant state acquisition device (14) configured to acquire an occupant state of the vehicle;

a vehicle schedule database (41) configured to store vehicle schedule data correlated with the vehicle, wherein the electronic control unit (40) is configured to give a request for personal authentication to the occupant in a case where an engine of the vehicle that is not scheduled in the vehicle schedule data is started;

a destination candidate database (6) configured to store destination candidate data including a destination candidate and the occupant state correlated with the destination candidate; and

an electronic control unit (10; 30; 40; 50; 60) configured to

determine whether or not the vehicle is in a boarding completion state based on the vehicle state and the occupant state, and

set a destination of the vehicle in autonomous driving based on the position of the vehicle on the map, the occupant state, and the destination candidate data in a case where electronic control unit (10; 30; 40; 50; 60) determines that the vehicle is in the boarding completion state;

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the vehicle is in the boarding completion state during stopping of an engine of the vehicle, the electronic control unit (10; 30; 40; 50; 60) is configured to determine whether or not a preset engine starting condition is satisfied based on the vehicle state; and

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the engine starting condition is satisfied, the electronic control unit (10; 30; 40; 50; 60) is configured to start the engine of the vehicle.

2. The autonomous driving system (100; 200; 300; 400; 500) according to claim 1, wherein:

the destination candidate data includes the destination candidate and the occupant state and a time correlated with the destination candidate; and

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the vehicle is in the boarding completion state, the electronic control unit (10; 30; 40; 50; 60) sets a destination of the vehicle in autonomous driving based on a current time, the position of the vehicle on the map, the occupant state, and the destination candidate data.

3. The autonomous driving system (200; 500) according to claim 2, further comprising a terminal communication device (31) configured to perform communication with a portable information terminal of an occupant of the vehicle, wherein:

the electronic control unit (30; 60) is configured to acquire schedule data of the occupant from the portable information terminal through communication using the terminal communication device (31); and

the electronic control unit (30; 60) sets a destination of the vehicle in autonomous driving based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and the schedule data.

4. The autonomous driving system (200; 300; 500) according to claim 2, further comprising:

a network communication device (32) configured to perform communication with an information network; and

a personal authentication device (34) configured to perform personal authentication of the occupant of the vehicle, wherein:

the electronic control unit (30; 40; 60) is configured to acquire schedule data of the occupant having undergone the personal authentication by the personal authentication device (34) through communication using the network communication device (32); and

the electronic control unit (30; 40; 60) sets a destination of the vehicle in autonomous driving based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and the schedule data.

5. The autonomous driving system (200; 300; 500) according to claim 3 or 4, wherein, in a case where the schedule data of a plurality of the occupants is acquired, the electronic control unit (30; 40; 60) sets a destination of the vehicle in autonomous driving based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and prioritization data set in advance.

6. The autonomous driving system (100; 200; 300; 400; 500) according to claim 1, further comprising:

a presentation device (7) configured to present information to the occupant; and

an input device (7) configured to receive a permission operation of the occupant, wherein:

the electronic control unit (10; 30; 40; 50; 60) is configured to cause the presentation device (7) to present at least one of the destination candidates to the occupant based on the position of the vehicle on the map, the occupant state, and the destination candidate data, in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the vehicle is in the boarding completion state;

the electronic control unit (10; 30; 40; 50; 60) is configured to determine whether or not the destination candidate is permitted by the occupant based on an input from the input device (7); and

the electronic control unit (10; 30; 40; 50; 60) is configured to set the destination candidate as a destination of the vehicle in autonomous driving in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the destination candidate is

permitted by the occupant.

7. The autonomous driving system (100; 200; 300; 400; 500) according to claim 6, wherein:

the destination candidate data includes the destination candidate and the occupant state and a time correlated with the destination candidate; and

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the vehicle is in the boarding completion state, the electronic control unit (10; 30; 40; 50; 60) presents the destination candidate to the occupant based on the current time, the position of the vehicle on the map, the occupant state, and the destination candidate data.

8. The autonomous driving system (200; 500) according to claim 7, further comprising a terminal communication device (31) configured to perform communication with a portable information terminal of an occupant of the vehicle, wherein:

the electronic control unit (30; 60) is configured to acquire schedule data of the occupant from the portable information terminal through communication using the terminal communication device (31);

the schedule data includes a scheduled destination correlated with a scheduled time; and

the electronic control unit (30; 60) is configured to present at least one of the destination candidate and the scheduled destination to the occupant based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and the schedule data.

9. The autonomous driving system (200; 300; 500) according to claim 7, further comprising:

a network communication device (32) configured to perform communication with an information network; and

a personal authentication device (34) configured to perform personal

authentication of the occupant of the vehicle, wherein:

the electronic control unit (30; 40; 60) is configured to acquire schedule data of the occupant having undergone the personal authentication by the personal authentication device (34) through communication using the network communication device (32);

the schedule data includes a scheduled destination correlated with a scheduled time; and

the electronic control unit (30; 40; 60) is configured to present at least one of the destination candidate and the scheduled destination to the occupant based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and the schedule data.

10. The autonomous driving system (200; 300; 500) according to claim 8 or 9, wherein, in a case where the schedule data of a plurality of the occupants is acquired, the electronic control unit (30; 40; 60) is configured to present at least one of the destination candidate and the scheduled destination to the occupant based on the current time, the position of the vehicle on the map, the occupant state, the destination candidate data, and prioritization data set in advance.

11. The autonomous driving system (100; 200; 300; 400; 500) according to any one of claims 1 to 10, wherein:

the electronic control unit (10; 30; 40; 50; 60) is configured to determine whether or not the occupant permits the destination to be stored in the destination candidate database (6);

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that the occupant permits the destination to be stored in the destination candidate database (6), the electronic control unit (10; 30; 40; 50; 60) is configured to store the destination in the destination candidate database (6) as the destination candidate in correlation with the occupant state; and

in a case where the electronic control unit (10; 30; 40; 50; 60) determines that

the occupant does not permit the destination to be stored in the destination candidate database (6), the electronic control unit (10; 30; 40; 50; 60) does not store the destination in the destination candidate database (6).