CLAIMS

1. A method for facilitating transportation services between a user and a vehicle having an autonomous driving mode, the method comprising:

receiving, by one or more server computing devices having one or more processors, information identifying a current location of the vehicle;

determining, by the one or more server computing devices, that the user is likely to want to take a trip to a particular destination based on prior location history for the user;

dispatching, by the one or more server computing devices, the vehicle to cause the vehicle to travel in the autonomous driving mode towards a location of the user without receiving a specific request for the vehicle; and

after dispatching, by the one or more server computing devices, sending a notification to a client computing device associated with the user indicating that the vehicle is currently available to take the user to the particular destination.

2. The method of claim 1, further comprising, prior to determining that the user is likely to want to take a trip, identifying the vehicle as available to transport a passenger.

3. The method of claim 1, further comprising, prior to determining that the user is likely to want to take a trip, identifying the vehicle will become available to transport a passenger within a predetermined expected period of time.

4. The method of claim 1, further comprising:

receiving, by the one or more server computing devices, information identifying a current location of the client computing device; and

wherein determining that the user is likely to want to take a trip is further based on the current location of the client computing device.

5. The method of claim 4, wherein the current location of the client computing device is the location of the user, and the notification further indicates that the vehicle is currently at the current location of the client computing device.

6. The method of claim 1, further comprising:

receiving, by the one or more server computing devices, information identifying a

current location of the client computing device;

prior to determining that the user is likely to want to take a trip, identifying a set of users within a predetermined distance of the current location of the vehicle, and

wherein determining that the user is likely to want to take a trip, includes selecting the user from the set of users based on the prior location history for the user.

7. The method of claim 1, further comprising:

receiving, by the one or more server computing devices, the prior location history of the user;

generating, by the one or more server computing devices, one or more task metrics for the user based on the prior location history, the one or more task metrics each define a location to which the user is likely to need to travel, and

wherein determining that the user is likely to want to take a trip is further based on the one or more task metrics.

8. The method of claim 7, wherein the one or more task metrics includes a task metric indicating that the user is likely to need to travel to the particular destination.

9. The method of claim 1, wherein dispatching includes instructing the vehicle to wait for further instructions.

10. The method of claim 1, further comprising receiving calendar information for the user, wherein determining that the user is likely to want to take a trip is further based on a calendar entry of the calendar information.

11. The method of claim 10, further comprising:

generating, by the one or more server computing devices, one or more task metrics for the user based on the calendar entry, the one or more task metrics each define a location to which the user is likely to need to travel, and

wherein determining that the user is likely to want to take a trip is further based on the one or more task metrics.

12. The method of claim 1, further comprising:

receiving, by the one or more computing devices, from the client computing device information indicating acceptance of a trip in response to the notification; and

in response to receiving the information indicating acceptance of a trip, sending, by the one or more computing devices, updated dispatching instructions to the vehicle.

13. The method of claim 12, wherein the updated dispatching instructions include information identifying the user's client computing device to allow the vehicle to authenticate the user.

14. The method of claim 13, further comprising:

receiving, by the one or more server computing devices, information identifying a current location of the client computing device, and

wherein the notification further indicates that the vehicle is currently traveling towards the current location of the client computing device and an estimated time of arrival of the vehicle for the current location of the client computing device;

determining that the vehicle will not reach the current location of the client computing device within the estimated time of arrival; and

based on the determination that the vehicle will not reach the current location of the client computing device within the estimated time of arrival, generating a second notification including an offer to occupy the user until the vehicle is able to pick up the user.

15. The method of claim 14, wherein the offer suggests that the user wait at a particular location until the vehicle is available.

16. The method of claim 15, wherein the notification further indicates an estimated time of arrival of the vehicle at the current location of the client computing device.

17. The method of claim 1, further comprising:

receiving, by the one or more server computing devices, information identifying a current location of the client computing device, and

wherein the notification further indicates that the vehicle is currently at the current location of the client computing device.

18. The method of claim 1, further comprising:

receiving location information identifying current locations of a plurality of client computing devices each associated with a different user; and

sending the notification to each of the plurality of client computing devices, wherein the notification indicates that multiple seats are available to users for a trip to the particular destination.

19. The method of claim 18, further comprising:

receiving, in response to sending the notification to the plurality of client computing devices, information indicating acceptance of a trip for each of the multiple seats from a first portion of the plurality of client computing devices; and

after receiving the information indicating acceptance of a trip, sending to a second portion of the plurality of client computing devices a notification that the multiple seats are no longer available.

20. A system for facilitating transportation services between a user and a vehicle having an autonomous driving mode, comprising:

one or more server computing devices having one or more processors configured to:

receive information identifying a current location of the vehicle;

determine that the user is likely to want to take a trip to a particular destination based on prior location history for the user;

dispatch the vehicle to cause the vehicle to travel in the autonomous driving mode towards a location of the user without receiving a specific request for the vehicle; and

after dispatching, send a notification to a client computing device associated with the user indicating that the vehicle is currently available to take the user to the particular destination.