

Power EnJoy

RASD

Requirement Analysis and Specification Document

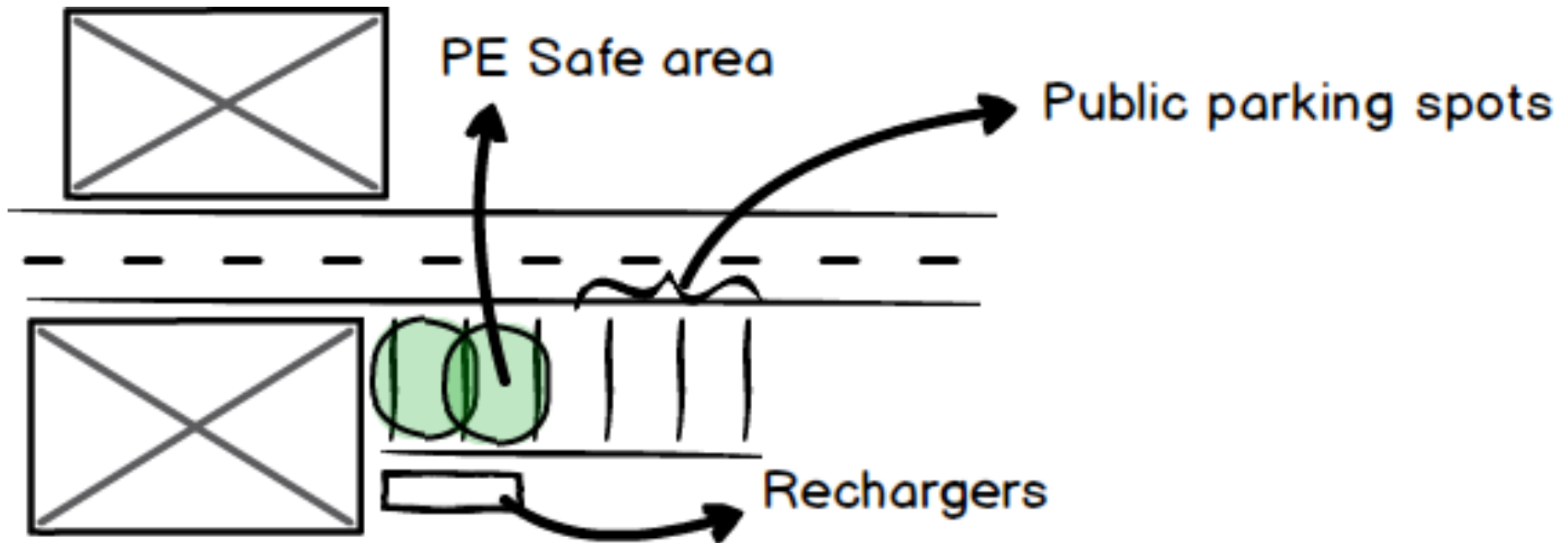
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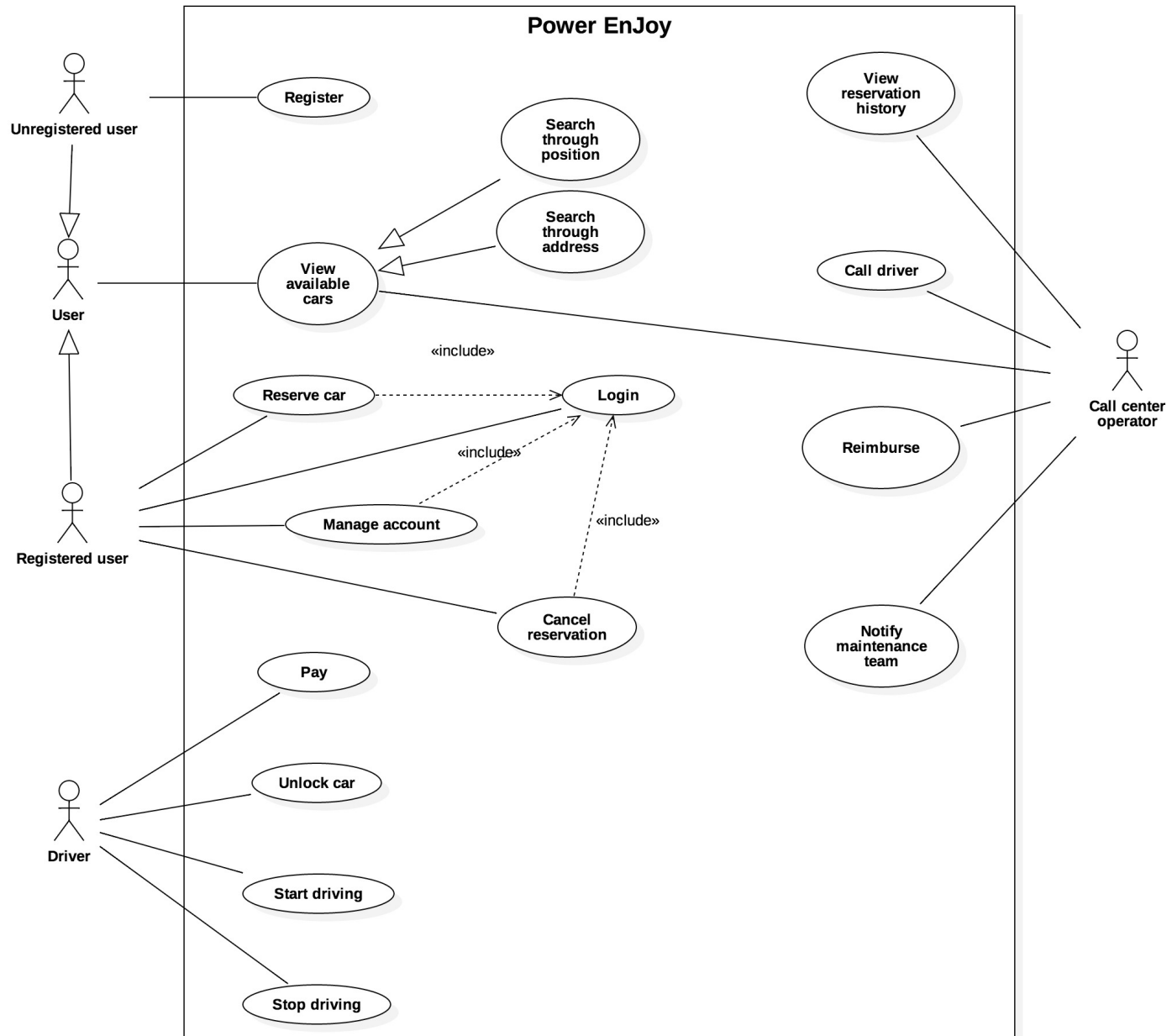
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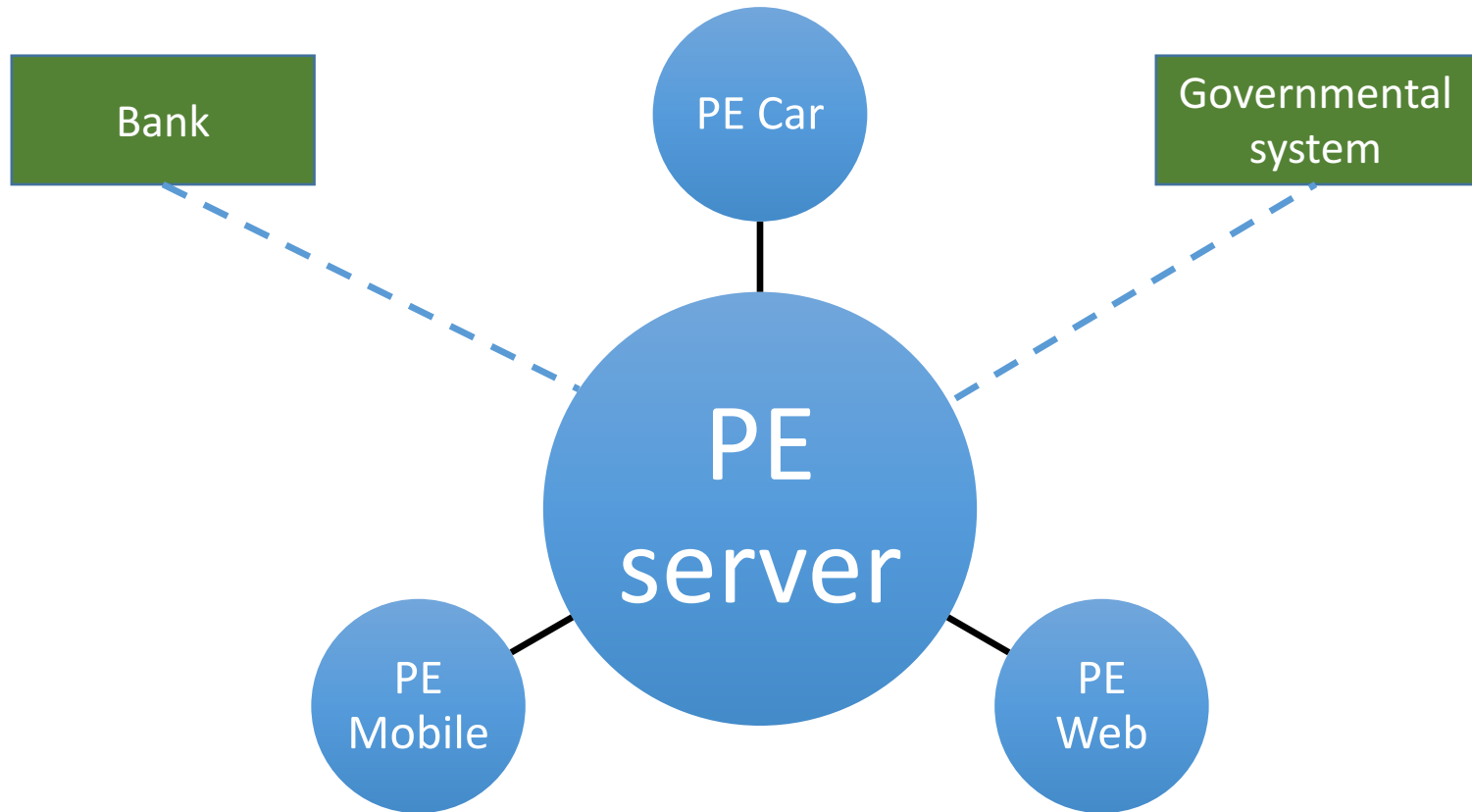
Safe areas



Use case diagram



Power Enjoy components



Goals

- **[G1] Build an effective and reliable electric car sharing system.**
 - [G1.1] Allow every user to view available cars near or in a given position.
 - [G1.2] Allow (activated) registered users to reserve available cars.
 - [G1.3] Allow users to drive their reserved car.
 - [G1.4] Allow users to cancel the reservation.
 - [G1.5] Allow users to access to PE and manage their account.
- **[G2] Encourage drivers to behave correctly and with respect to the law.**
- **[G3] Offer an easy-to-use system for call center operators to monitor cars and give assistance to drivers.**

G1.1 View available cars nearby or in a given position

- PEM and PEW should be able to **retrieve device position** either with a GPS antenna or by using browser geolocalization after obtaining the user's permission.
- PE should be able to find the GPS coordinate given a specific address.
- **Every car must respond with their GPS coordinate when it is asked by PE.**
- The user should be able to specify the range of the area where to find available cars.
- The user should be able to visualize the battery level of available cars.

G1.2 Reserve available cars

- Each user should have **only one active reservation at a time**.
- All reservations must be related to only one car and each car can be bound to at most one reservation at a time.
- When the user reserves a car, it automatically becomes reserved and won't be visible to other users until the reservation is cancelled or he/she stops driving.
- **Each reservation should expire after a fixed amount of time** (e.g. 1 hour). If the user forgets to cancel the reservation within that deadline, user should incur in a penalty fee.
- **A car should be available only if it has at least 20% battery full.**

G1.3 Drive the reserved car

- Every car should be able to unlock every time they receive an unlock message by PE.
- The user should be able to unlock the car either via SMS (e.g. with an 'UNLOCK' message) or PEM.
- The car should lock the door after a fixed amount of time (e.g. 30 seconds) it have been unlocked. If the doors are still open after that time, the car will lock as soon as the doors closes.
- The user should be able to stop the ride either via SMS (e.g. with a 'STOP' message) or PEM

G1.3 Drive the reserved car (2)

- The user should be able to pay for all his rides monthly.
- The car should be able to detect whether it is on a PE safe area or not.
- The car should be able to **detect the number of passengers** it is carrying.
- User should be aware of current charge when driving through a screen in the car.
- PE should **start charging the user either when the car engine ignites or when a fixed amount of time (e.g. 10 minutes) is passed from the first unlock** made by the user.

G1.4 Cancel the reservation

- User should be able to **cancel a pending reservation only before he/she unlocks the car** for the first time
- User should be able to view his/her pending reservation.

G1.5 Allow users to access to PE and manage their account.

- PE should **verify all the data** changed by the user
- User should be able to:
 - Change password
 - Change/update driving license and ID card
 - Change phone number
 - View pending reservation (if any) and all past reservation
 - View the bills to pay and/or already paid
 - Change payment informations
- Users should be able to register and create an account.
- Users should be able to log in with a previously created account

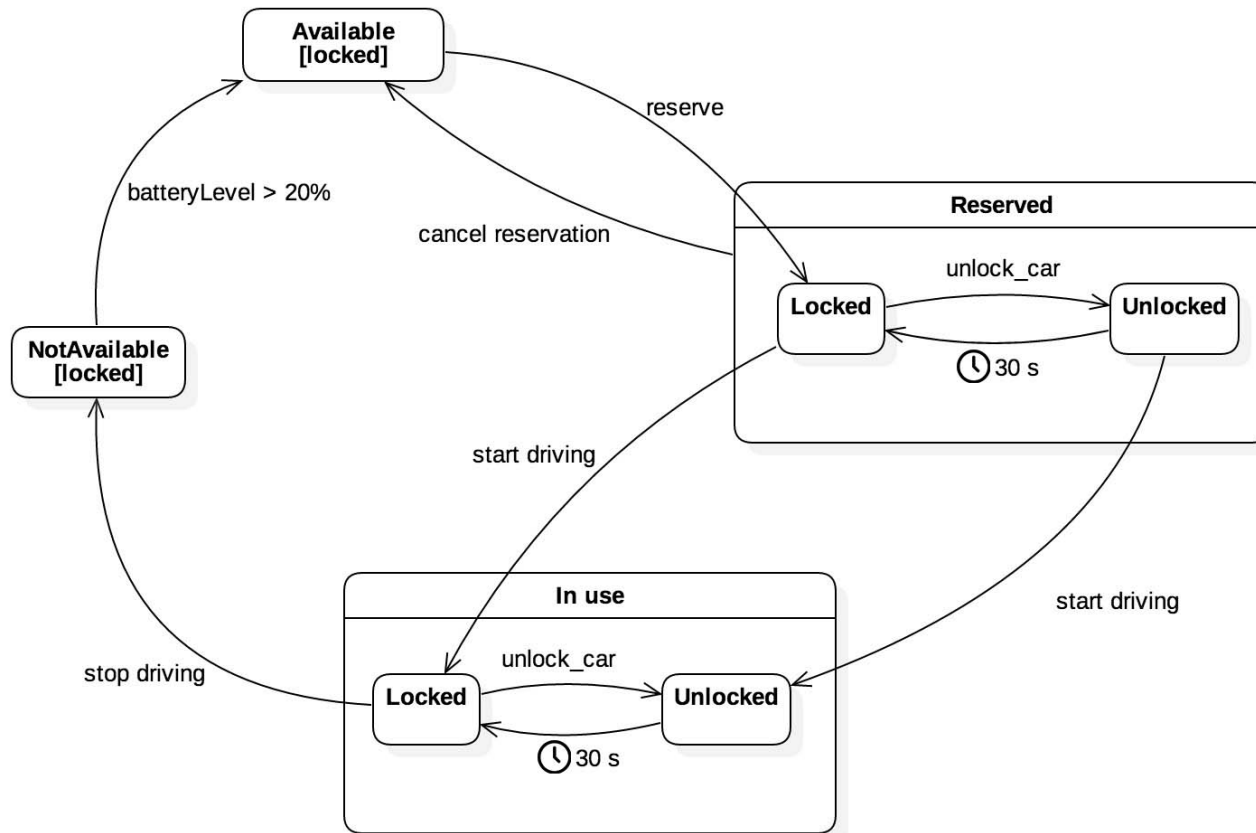
G2 Encourage drivers to behave correctly and with respect to the law.

- PE should be able to retrieve driver information for a specified car in a given time.
- PE should be able to **verify the correctness of the driving license and ID card of a driver** (e.g. using a governmental system)
- PE should **apply some discounts** on the ride in this situations:
 - The driver is carrying at least 2 passengers
 - The driver leaves the car with at least 50% of battery full.
 - The driver parks in a PE safe area and plugs the car in the power grid
- PE should **apply some penalty fees** on the ride in this situations:
 - The driver parks the car far from the nearest PE safe area (e.g. the nearest PE safe area is at least 3 km far)
 - The driver leaves the car with less than 20% of battery full.
- PE should **periodically check the validity of the documents presented by each user** and forbid user to reserve cars with out-of-date documents.

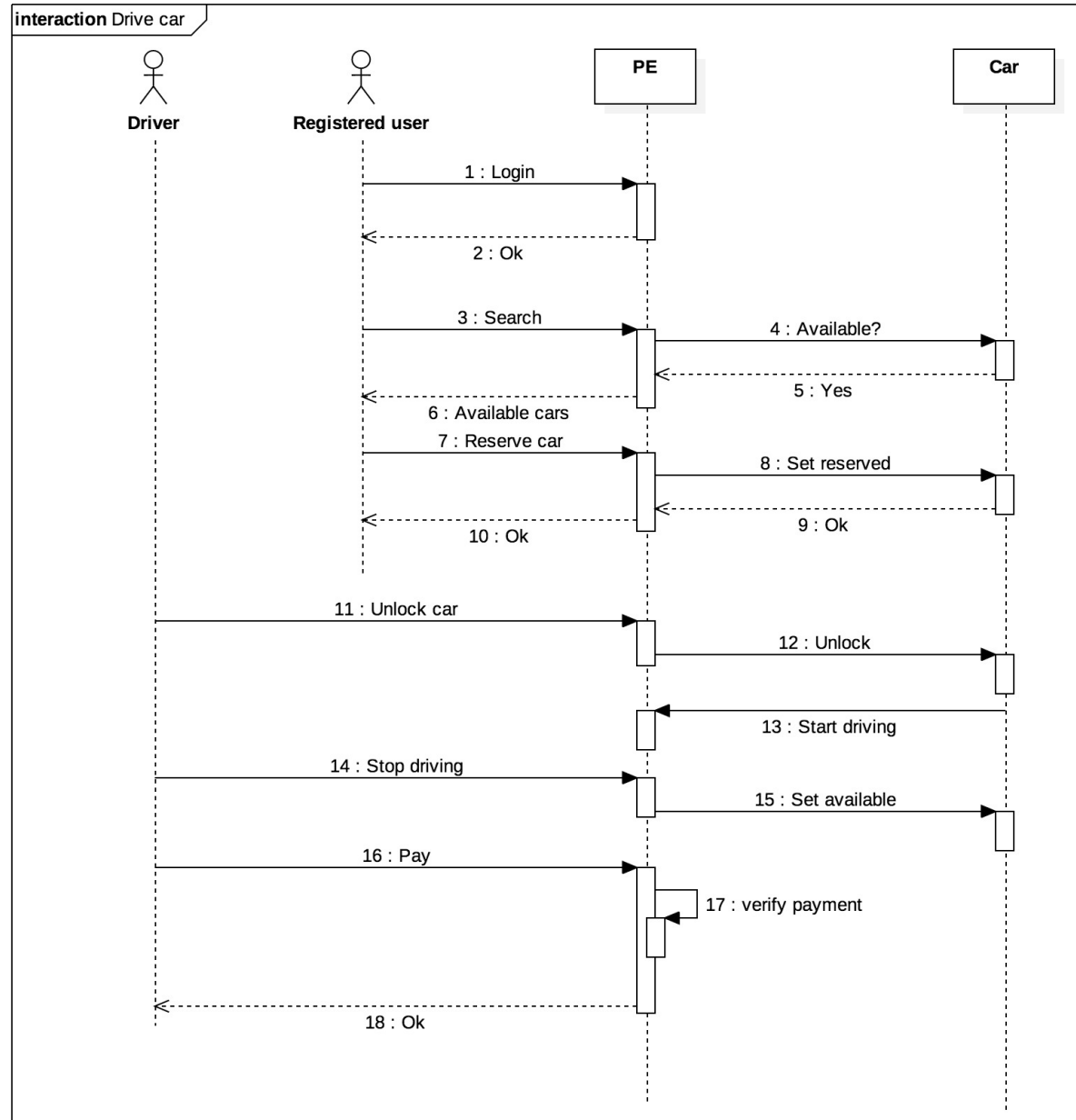
G3 Monitor cars and give assistance to drivers

- Call center operators should be able to:
 - View the position of all the cars on road
 - Notify maintenance operators
 - Reimburse the driver
 - Call the driver
 - Notify police/ambulance of emergencies.
 - View the reservation history of each car.

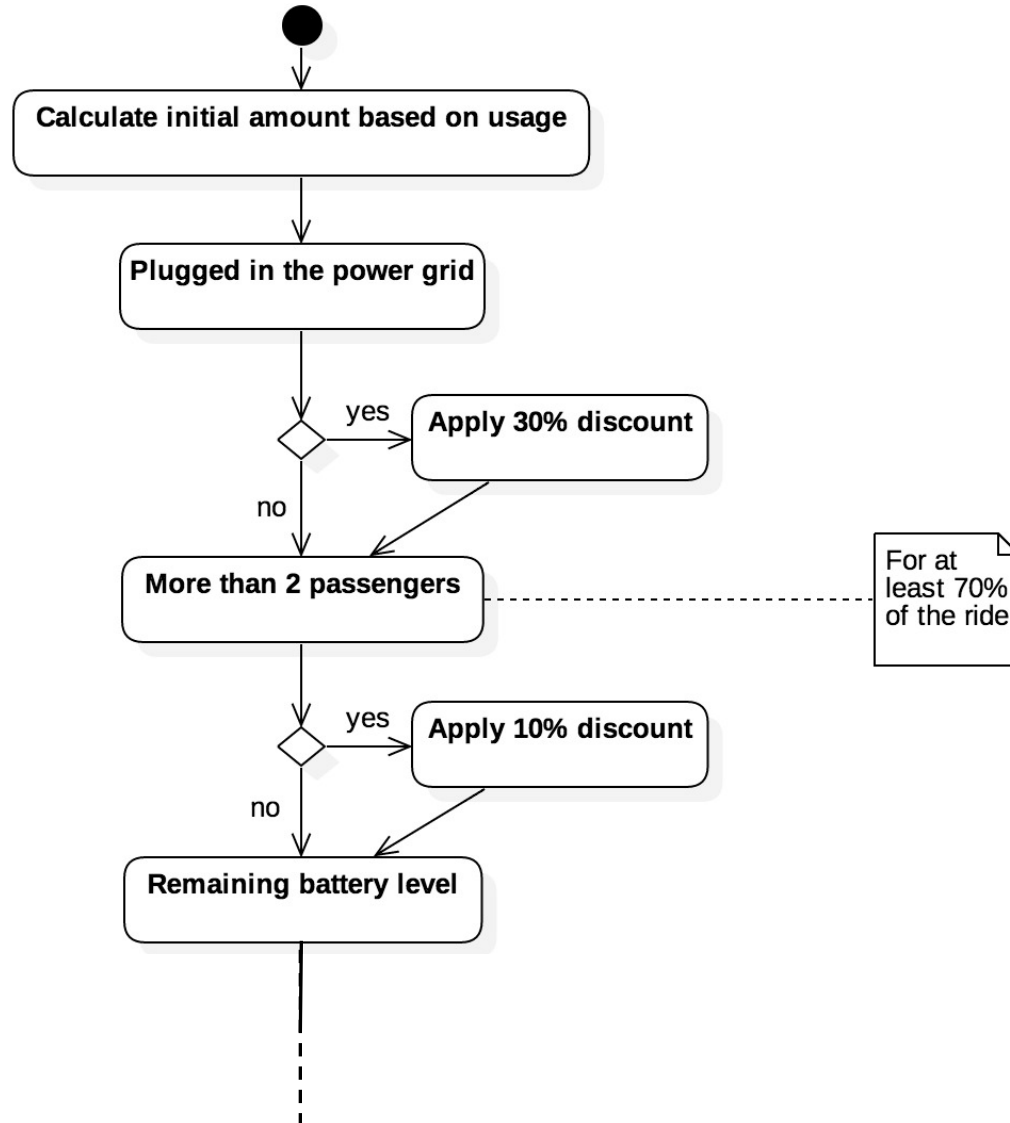
Car state



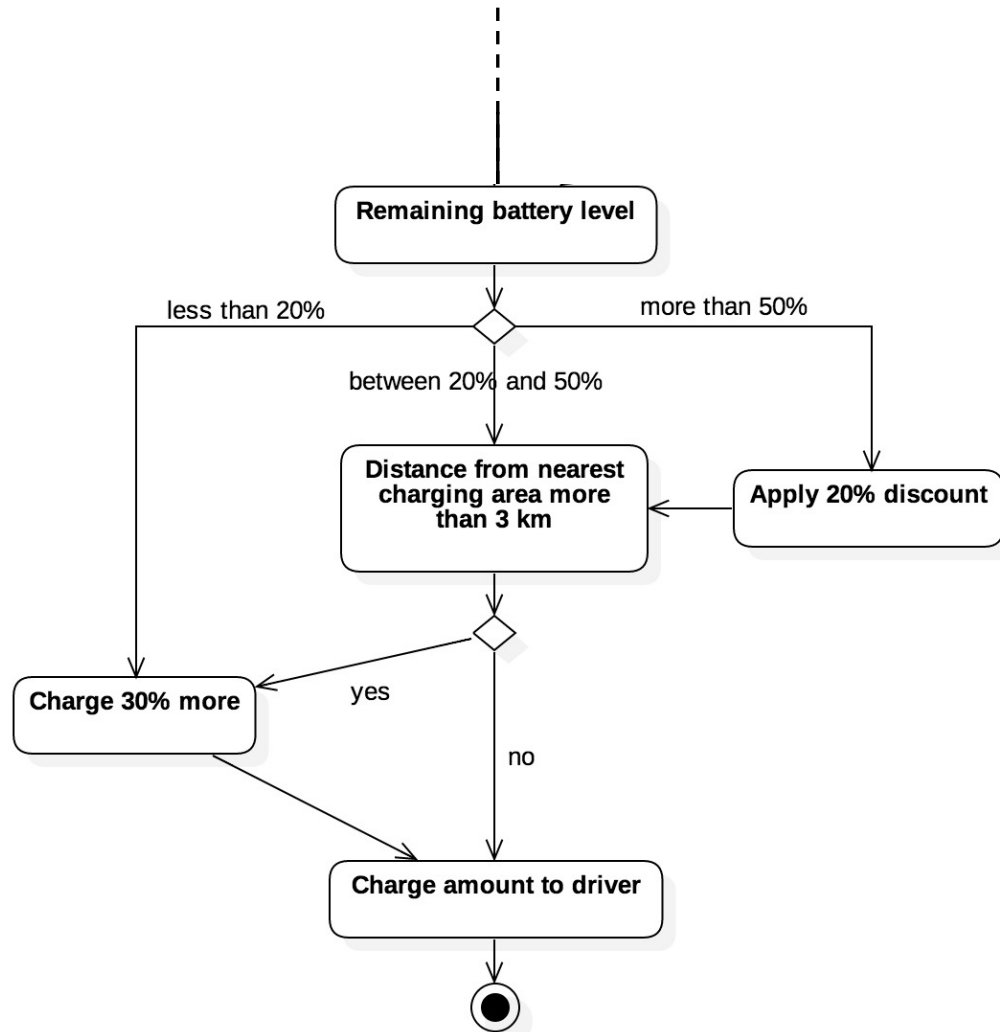
Reserve car sequence diagram



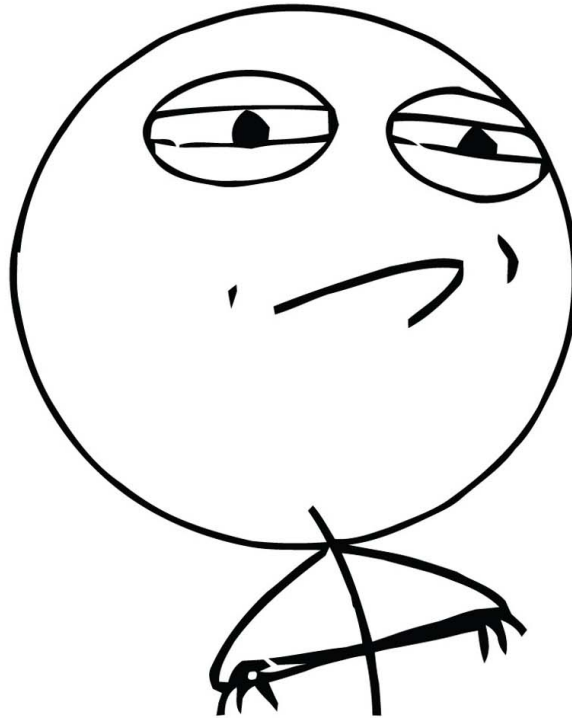
Calculate discounts



Calculate discounts (2)



We're done.



Any questions?