CLAIMS

1. A method (200) for rebalancing stations (104) for collecting/returning vehicles made available for shared use, said method (200) comprising the following steps:

- for each station, detecting (202) each vehicle departure from and arrival at said station and storing (202) the data relating to said station in association with an item of time data,
- for each station (104), determining:
  - a number of vehicles available at said station (104),
  - a waiting time of each vehicle at said station (104), and
- determining (204) and storing an average waiting time for each station as a function of the data stored in association with a given time slot,
- filtering (206) the stations (104) as a function of the number of vehicles available at the station and the average waiting time, said filtering (206) providing:
  - a first list, said departure station list, and
  - a second list, said arrival station list,
- designing (208) at least one vehicle movement operation between a station on the first list and a station on the second list, and
- carrying out (214) at least one vehicle movement operation.

2. The method (200) according to claim 1, characterized in that the waiting time corresponds to a period between a return of a vehicle to said station and a collection of a vehicle from said station subsequent to said return.

3. The method (200) according to claim 2, characterized in that at least one of the filtering or design steps (212) is carried out by taking into account, for each station, at least one item of data relating to at least one neighbouring station of said station, the data or one of the items of data

being a number of vehicles in a set, a zone, comprising said station and the stations closest to it.

4. The method (200) according to claim 3, characterized in that a zone is defined as comprising:

- all of the stations located at a distance and/or predetermined journey time as a function of the station in relation to which it is determined; or
- a predetermined number of stations closest to the station in relation to which it is determined.

5. The method (200) according to claim 3 or claim 4, characterized in that the filtering (206) comprises the following steps carried out for at least one, preferably each, station (104):

- comparing (502) the total number of vehicles at the station or in the zone associated with said station (104) to a first threshold;
- when said total number is above said first threshold, adding (506) said station (104) to a list, said list of stations to be relieved;
- comparing (508) said total number to a second threshold, lower than said first threshold;
- when said total number is below said second threshold, adding (512) said station to a list, said list of stations to be supplied.

6. The method (200) according to claim 5, characterized in that it comprises a determination (504), for at least one station (104), in particular each station on the list of stations to be relieved, of a parameter, said occupancy rate, as a function of:

- the number of vehicles available at the station (104), and
- the average waiting time for a given time slot at said station (104);

the filtering step being carried out taking into account the value of said occupancy rate.

7. The method (200) according to claim 6, characterized in that the filtering step (206) comprises a step of selecting (210) departure stations, in particular from the list of stations to be relieved as a function of the occupancy rate, said selection step comprising the following steps:

- determining (612-616) a number of operators (142) available for moving a vehicle;
- for each operator (142) available, by successive iterations:
  - determining (618) the station, in particular on the list of stations to be relieved, with the highest associated occupancy rate;
  - adding (620) said station to the list of departure stations;
  - updating (622) the occupancy rate associated with said selected station by subtracting one vehicle from the number of vehicles available at said station.

8. The method (200) according to claim 7, characterized in that it also comprises the determination (414) of a parameter, said flow, as a function of the average waiting time and an average time, said return time, corresponding to the average time between the collection of a vehicle and the subsequent return of a vehicle to the station, the flow corresponding in particular to the inverse of the average waiting time minus the inverse of the average return time, the filtering step (206) comprising the selection (210) of at least one departure station as a function of said flow, said selection comprising at least one iteration of the following steps:

- comparing (606) the flow associated with a station (104) to a first threshold, in particular negative;
- when said flow is below said first threshold, adding (608) said station to the list of departure stations.

9. The method (200) according to claim 8, characterized in that the selection step (608) as a function of the flow is carried out before the step (612-616) of determining the number of available operators, the number of available operators taking into account the number of stations at which the flow is below said threshold.

10. The method (200) according to any one of claims 5-7, characterized in that it also comprises the determination (414) of a parameter, said flow, as a function of the average waiting time and an average time, said return time, corresponding to the average time between the collection of a vehicle and the subsequent return of a vehicle to the station, the flow corresponding in particular to the inverse of the average waiting time minus the inverse of the average return time, the filtering step comprising at least one iteration of the following steps:

- comparing (604) said flow with a value range;
- when said flow is within the value range, excluding (610) said station from the list of stations to be relieved or supplied.

11. The method (200) according to claim 6 or 7, characterized in that it comprises the determination (510), for at least one station (104), in particular each station on the list of stations to be supplied, of a parameter, said relief rate, as a function of:

- the number of vehicles available at the station (104), and
- the average waiting time for a given time slot at said station (104);

the filtering step being carried out taking into account the value of said relief rate.

12. The method (200) according to the preceding claim, characterized in that the filtering step (206) comprises a step of selecting (210) arrival stations, in particular from the list of stations to be supplied, as a function of the relief rate, said selection step comprising the following steps:

- determining (612) a number of operators (142) available for moving a vehicle;
- for each available operator (142), by successive iterations:
  - determining (624) the station, in particular on the list of stations to be supplied, with the lowest associated relief rate;
  - adding (626) said station to the list of arrival stations;

- updating (628) the relief rate associated with said selected station by adding one vehicle to the number of vehicles available at said station.

13. The method (200) according to claims 11 or 12, characterized in that the design step comprises a step (212) of determining a balancing time, carried out before the movement step (214), comprising the following operations, carried out by successive iterations:

- for each station on the list of departure stations, determining (702) a parameter, said departure parameter, as a function at least of the occupancy rate;
- for each station on the list of arrival stations, determining (704) a parameter, said arrival parameter, as a function at least of the relief rate;
- calculating (706) the balancing time between each of the stations on the departure station list and each of the stations on the arrival station list, as a function of said departure and arrival parameters and a journey time between said departure and arrival stations; and
- selecting the movements as a function of the balancing times respectively calculated.

14. The method (200) according to claim 13, characterized in that:

- the departure parameter is also calculated as a function of a probability of transfer to at least one closer station, in particular to all of the stations in the zone associated with said station; and/or
- the arrival parameter is also calculated as a function of a probability of transfer to at least one closer station, in particular to all of the stations in the zone associated with said station.

15. The method (200) according to claim 13 or claim 14, characterized in that the design step (208) takes into account the balancing time by at least one iteration of the following steps:

- determining (708) the maximum balancing time from the balancing times calculated;
- determining (708) the departure and arrival stations with which said maximum balancing time is associated and selecting these stations;
- excluding the stations from the departure and arrival lists;
- updating the number of vehicles at the departure and arrival stations as if the movement had already taken place.

16. The method (200) according to any one of the preceding claims, characterized in that the design step (208) comprises a step of selecting an operator to carry out a vehicle movement, said selection comprising the following steps:

- determining (714) the geographical position of each available operator;
- as a function of said geographical position, determining (716) the operator closest to the departure station involved in said movement;
- sending (718) a message to said closest operator to inform him of the task to be carried out;
- updating the status of the operator to unavailable.

17. The method (200) according to any one of the preceding claims, characterized in that the time slot is a rolling time slot, the range of which is predetermined and calculated as a function of the current time.

18. The method (200) according to any one of the preceding claims, characterized in that the waiting times stored are associated with at least one criterion, with only the waiting times associated with this criterion being used to calculate the average waiting time.

19. The method (200) according to claim 18, wherein the criterion is the type of day.

20. A system for rebalancing stations (104) for collecting/returning vehicles made available for shared use, said system comprising:

- means (124-128) for detecting each departure and each arrival of a vehicle at the station,
- means (132, 134) for determining, for each station, the following parameters:
  - a number of vehicles available,
  - a waiting time of each vehicle at the station,
- means (138) for storing data relating to the waiting time in association with an item of time data,
- means (132, 134) for determining an average waiting time as a function of the data stored in association with a given time slot,
- means (138) for storing the average waiting time determined,
- means (134, 138) for filtering the stations to be balanced as a function of said parameters, said filtering providing:
  - a first list, said departure station list, and
  - a second list, said arrival station list, and
- means (134, 138) for designing at least one vehicle movement operation between a station on the first list and a station on the second list.

21. A facility (100) for the shared use of vehicles, said facility (100) comprising:

- a plurality of vehicle collection/return stations (104); and
- means for implementing the steps of the rebalancing method (200) according to any one of claims 1 to 19, or a rebalancing system according to claim 20.