CLAIMS

1. A method of determining a real-time delay of a scheduled transportation means which runs along a route according to a timetable, wherein the route comprises at least one leg, wherein determining the real-time delay is based on a detailed reference schedule indicating arbitrary time-stamped reference positions of the transportation means being on time, the method comprising:
   - a position-based determination comprising
     - receiving a request for the transportation means' real-time delay by a user device located on the transportation means, the request indicating at least the current position of the transportation means;
     - calculating the transportation means' real-time delay on the basis of the current position indicated in the request, a time-stamp and the time-stamped reference positions of the detailed reference schedule;
     - returning the calculated real-time delay to the requesting user device; and
     - storing the calculated real-time delay into a logbook;
   - a time-based determination comprising
     - in response to a request by a different or the same user device not indicating the current position of the transportation means, returning the real-time delay on the basis of the logbook containing real-time delay entries with respect to the transportation means.

2. The method according to claim 1, wherein the time-stamp is determined by the reception of the request.

3. The method according to claim 1 or claim 2, wherein the arbitrary time-stamped reference positions of the transportation means are collected through requests by user devices located on the transportation means, wherein the requests indicate at least the current position of the transportation means and the transportation means is validated to be on time.

4. The method according to any one of claims 1 to 3, wherein in response to a request by a different or the same user device not indicating the current position of the transportation means, the most recent real-time delay entry in the logbook is returned.

5. The method according to any one of claims 1 to 3, wherein in response to a request by a different or the same user device not indicating the current position of the transportation means, real-time delay entries in the logbook are extrapolated; and the result of the extrapolation is returned.

6. The method according to any one of the previous claims, wherein the request by a different or the same user device not indicating the current position of the transportation means is transmitted by a device incapable of determining its current position.

7. The method according to any one of the previous claims, wherein calculating the real-time delay comprises a linear interpolation between the time-stamped reference positions in the detailed reference schedule in case the current position indicated in the request by the user device does not exactly match an entry in the detailed reference schedule indicating one of the time-stamped reference positions.

8. The method according to any one of the previous claims, wherein the request further contains an identification code which allows identifying the timetable of the transportation means.

9. The method according to anyone of the previous claims, wherein the position-based determination further comprises:
   - caching at least the detailed reference schedule at the requesting user device, and
   - in response to a request by the user device indicating at least the current position of the transportation means, determining the real-time delay locally at the user device.

10. The method according to claim 9, wherein the position-based determination further comprises:

- storing the locally determined real-time delay in a local logbook of the user device, and
- the user device transmitting the local logbook to include it into a central logbook.

11. The method according to anyone of the previous claims, the transportation means being a train, a ship, a bus, an airplane, a tram or a shuttle service vehicle.

12. A computer system for determining a real-time delay of a scheduled transportation means which runs along a route according to a timetable, wherein the route comprises at least one leg, wherein determining the real-time delay is based on a detailed reference schedule indicating arbitrary time-stamped reference positions of the transportation means being on time,
    - the computer system being configured to perform a position based determination of the real-time delay of the transportation means by being configured to:
        - receive a request for the transportation means' real-time delay by a user device located on the transportation means, the request indicating at least the current position of the transportation means;
        - calculate the transportation means' real-time delay on the basis of the current position indicated in the request, a time-stamp indicated by the reception of the request, and the corresponding time-stamped reference position of the detailed reference schedule;
        - return the calculated real-time delay to the requesting user device;
        - store the calculated real-time delay into a logbook;
    - the computer system further being configured to perform a time-based determination of the real-time delay of the transportation means by being configured to
        - return the real-time delay on the basis of the logbook containing real-time delay entries with respect to the transportation means in response to a request by a different or the same user device not indicating the current position of the transportation means.

13. A non-transitory computer readable storage medium having computer program instructions stored therein, which when executed on a computer system cause the computer system to determine a real-time delay of a scheduled transportation means which runs along a route according to a timetable, wherein the route comprises at least one leg, wherein determining the real-time delay is based on a detailed reference schedule indicating arbitrary time-stamped reference positions of transportation means being on time, the instructions – when executed – causing the computer system

- in a position-based determination to
  - receive a request for the transportation means' real-time delay by a user device located on the transportation means, the request indicating at least the current position of the transportation means;
  - calculate the transportation means' real-time delay on the basis of the position indicated in the request, a time-stamp indicated by the reception of the request, and the corresponding time-stamped reference position of the detailed reference schedule;
  - return the calculated real-time delay to the requesting user device; and
  - store the calculated real-time delay into a logbook;
- in a time-based determination to
  - in response to a request by a different or the same user device not indicating the current position of the transportation means, return the real-time delay on the basis of the logbook containing real-time delay entries with respect to the transportation means.

14. Computer program for instructing a computer to perform the method of anyone of the claims 1 to 11.

Claims

1. A method of updating an end-user with respect to a scheduled transport, the method comprising:
receiving, in a server, a first request for a first progression update for the scheduled transport from a first user device on or at the scheduled transport, the first request including data indicating a current position of the scheduled transport;
in response to receiving the first request, determining, by the server, the current position of the scheduled transport based on the data indicating the current position of the scheduled transport in the first request;
querying, by the server, a detailed reference schedule database for an expected time for the scheduled transport to be in the current position;
determining, by the server and based on the current position of the scheduled transport, a first time difference between a real-time the scheduled transport is in the current position and the expected time for the scheduled transport to be in the current position;
returning, by the server, the first progression update to the first user device, the first progression update including the first time difference determined by the server;
storing, by the server, the first time difference and the current position of the scheduled transport as a time-stamped entry in a logbook database;
receiving, in the server, a second request for a second progression update from a second user device;
in response to receiving the second request, querying, by the server, the logbook database for the first time difference;
determining, by the server, a second time difference between the real-time the scheduled transport is in the current position and the expected time the scheduled transport is to be in the current position based on the first time difference obtained from the logbook database; and
returning, by the server, the second progression update to the second user device, the second progression update including the second time difference.

2. The method of claim 1 wherein the detailed reference schedule database includes a plurality of time-stamped reference positions corresponding to the expected progression of the scheduled transport.

3. The method of claim 2 wherein the first request is one of a plurality of first requests each including data indicating the current position of the scheduled transport, and further comprising:
validating the first requests by discarding first requests that are not associated with progression updates indicating that the scheduled transport is on-time;
associating a time-stamp with the current position in each first request of the validated first requests; and

storing the time-stamped current position data of the validated first requests in the detailed reference schedule database to define the plurality of time-stamped reference positions.

4. The method of claim 2 further comprising: determining a reference motion curve for the scheduled transport based on the plurality of time-stamped reference positions.

5. The method of claim 1 further comprising: caching the detailed reference schedule database in the first user device, wherein the detailed reference schedule database queried for the expected time for the scheduled transport to be in the current position is the cached database.

6. The method of claim 1 wherein determining the first time difference further comprises: associating a time-stamp with the first request; and comparing the time-stamp to the expected time to determine the first time difference.

7. The method of claim 6 wherein associating the time-stamp with the first request comprises determining a time the first request was received.

8. The method of claim 6 wherein associating the time-stamp with the first request comprises reading time-stamp data included in the first request.

9. The method of claim 1 wherein the logbook database is queried for the first time difference in response to the second request not including the data indicating the current position of the scheduled transport.

10. The method of claim 1 wherein determining the second time difference between the real-time the scheduled transport is to be in the current position and the expected time the scheduled transport is to be in the current position based on the first time difference obtained from the logbook database comprises:
extrapolating a plurality of stored first time differences in the logbook database to assess a trend in the stored first time differences; and
determining the second time difference based on the trend.

11. The method of claim 1 wherein determining the second time difference between the real-time the scheduled transport is to be in the current position and the expected time the scheduled transport is to be in the current position comprises: receiving a most recently stored first time difference in the logbook database.

12. The method of claim 1 further comprising: caching the logbook database in the second user device, wherein the logbook database queried for the first time difference between the real-time the scheduled transport is in the current position and the

expected time the scheduled transport is to be in the current position is the cached database.

13. The method of claim 1 wherein the first request includes an identification code, the method further comprising: determining the expected progression of the scheduled transport based on the identification code.

14. The method of claim 1 wherein the first request includes an identification code, and further comprising:
querying a passenger name record database for itinerary information related to the identification code; and
determining a current leg of the scheduled transport based on the itinerary information.

15. The method of claim 1 further comprising: determining that the first request includes data indicating the current position of the scheduled transport by validating that the current position indicated by the data corresponds to a position within a route of the scheduled transport.

16. The method of claim 1 further comprising:
prompting the end-user of the first user device to enter information identifying the scheduled transport; and
determining a current leg of the scheduled transport based on the information identifying the scheduled transport.

17. A computer system for updating an end-user with respect to a scheduled transport, the computer system comprising:
a processor;
a logbook database;
a detailed reference schedule database; and
a memory including a set of instructions that, when executed by the processor, cause the computer system to:
receive a first request for a first progression update for the scheduled transport from a first user device on or at the scheduled transport, the first request including data indicating a current position of the scheduled transport;
in response to receiving the first request, determine the current position of the scheduled transport based on the data indicating the current position of the scheduled transport in the first request;
query the detailed reference schedule database for an expected time for the scheduled transport to be in the current position;
determine, based on the current position of the scheduled transport, a first time difference between a real-time the scheduled transport is in the current position and the expected time for the scheduled transport to be in the current position;

return the first progression update to the first user device, the first progression update including the first time difference determined by the computer system;

store the first time difference and the current position of the scheduled transport as a time-stamped entry in the logbook database;

receive a second request for a second progression update from a second user device;

in response to receiving the second request, query the logbook database for the first time difference;

determine a second time difference between the real-time the scheduled transport is in the current position and the expected time the scheduled transport is to be in the current position based on the first time difference obtained from the logbook database; and

return the second progression update to the second user device, the second progression update including the second time difference.

18. A computer program product for providing updating an end-user with respect to a scheduled transport, the computer program product comprising:

a non-transitory computer readable storage medium; and

a set of instructions stored on the computer readable storage medium that, when executed by a processor, cause the processor to:

receive a first request for a first progression update for the scheduled transport from a first user device on or at the scheduled transport, the first request including data indicating a current position of the scheduled transport;

in response to receiving the first request, determine the current position of the scheduled transport based on the data indicating the current position of the scheduled transport in the first request;

query a detailed reference schedule database for an expected time for the scheduled transport to be in the current position;

determine, based on the current position of the scheduled transport, a first time difference between a real-time the scheduled transport is in the current position and an expected time for the scheduled transport to be in the current position;

return the first progression update to the first user device, the first progression update including the first time difference determined by the processor;

store the first time difference and the current position of the scheduled transport as a time-stamped entry in a logbook databases;

receive a second request for a second progression update from a second user device;

in response to receiving the second request, query the logbook database for the first time difference;

determine a second time difference between the real-time the scheduled transport is in the current position and the expected time the scheduled transport is to

be in the current position based on the first time difference obtained from the logbook database; and

return the second progression update to the second user device, the second progression update including the second time difference.