

DESCRIPTION

5 **TITLE: System for monitoring the movement of passengers in a transport network,
 and associated method and computer program product**

 The present invention relates to a monitoring system for the movement of
passengers in a transport network. The invention further relates to a method of monitoring
the movement of passengers in a transport network. The present invention further relates
10 to a computer program product for implementing the method for monitoring the movement
of passengers in a transport network.

 In the field of systems for monitoring the movement of passengers, it is known to
how use a local time distribution of passengers entering a transport network at a station of
the network in order to improve the service provided by the transport network. Knowing
15 such a distribution, it is indeed possible to estimate the congestion of the station and to
adapt not only the station to such a distribution but also to adapt the traffic of vehicles
serving the station according to the influx in the station characterized by the distribution.

 However, such systems are not entirely satisfactory. Indeed, said systems do not
take into account the local time distribution of passengers exiting the transport network at
20 the station. Such distribution is, however, not negligible and in certain situations, a majority
of passengers at a given station and at a given moment leave the network at the station,
whereas a minority enter the network at said station.

 Faced with such dissatisfaction, various systems have been proposed. In particular,
it has been proposed to measure a local time distribution of passengers exiting the transport
25 network at the given station. It is thereby possible to know precisely the movements of
passengers in the transport network.

 However, such a solution is particularly expensive and, as such, is not entirely
satisfactory.

 One of the aims of the invention is thus to obtain a system for monitoring the
30 movement of passengers in a transport network, that would be both accurate and
inexpensive.

 To this end, the subject matter of invention is a system for monitoring the movement
of passengers in a transport network, comprising a plurality of modules which can be
executed by at least one processor, the plurality of modules comprising:

35 - an overall acquisition module, configured to acquire an overall time
distribution of passengers entering the whole transport network over a first part of a day;

- a local acquisition module, configured to acquire a local number of passengers entering the network at a station of the network over a second part of the day;
- a determination module, configured to determine a local time distribution of passengers exiting the network at the station over the first part of the day, as a function of the local number of incoming passengers, acquired over the second part of the day and to the overall time distribution of incoming passengers, acquired over the first part of the day.

The use of the local number of incoming passengers, acquired over a second part of the day and of an overall time distribution of incoming passengers, acquired over a first part of the day for the calculation of a local time distribution of passengers exiting the network at the station over the first part of the day is particularly advantageous since same makes it possible to accurately estimate a local time distribution of outgoing passengers without the need for an installation for measuring such distribution.

According to other particular embodiments, the system comprises one or more of the following features, taken individually or according to all technically possible combinations:

- the first part of the day and the second part of the day are defined in such a way that an overall number of passengers entering the whole transport network is substantially equal over the first part of the day and over the second part of the day;
- the determination module is further configured to determine the local time distribution of passengers exiting the network at the station over the first part of the day as a function of an average travel time;
- the local acquisition module is further configured to acquire a local number of passengers entering the network at the network station over the first part of the day, the determination module, in order to determine a local time distribution of passengers exiting the network at the station over the first part of the day, being configured to:
 - calculate an overall time distribution of passengers exiting the whole transport network over the first part of the day, said overall time distribution of outgoing passengers corresponding to the overall time distribution of incoming passengers over the first part of the day, shifted by the average travel time;
 - calculate a local influx coefficient for the second part of the day, the local influx coefficient corresponding to the ratio between the local number of incoming passengers, acquired over the second part of the day and the

overall number of incoming passengers over the second part of the day;
and

- calculate the local time distribution of passengers exiting the network at the station over the first part of the day, by factoring the overall time distribution of incoming passengers calculated over the first part of the day by the local influx coefficient calculated for the second part of the day;

- the monitoring system is such that:
 - the overall acquisition module is further configured to acquire an overall time distribution of passengers entering the whole transport network over the second part of the day;

- the local acquisition module is configured to acquire a local number of passengers entering the network at the network station over the first part of the day;

- the determination module is further configured to determine a local time distribution of passengers exiting the network at the station over the second part of the day, as a function of the local number of incoming passengers, acquired over the first part of the day and the overall time distribution of incoming passengers, acquired over the second part of the day;

- the monitoring system comprises a display screen connected to the determination module, the display screen being configured to display the determined local time distribution of passengers exiting the network at the station over the part of the day;

- the monitoring system comprises:
 - a first entrance control device arranged at the station, said first entrance control device being configured to count the number of passengers entering the network at the station and to communicate said number of passengers to the local acquisition module;

- at least one second entrance control device arranged in the transport network,

the first and at least one second entrance control device being configured to jointly measure the overall time distribution of passengers entering the whole transport network and to communicate said overall time distribution to the overall acquisition module; and

- the monitoring system comprises a device for measuring a measured local time distribution of passengers exiting the network at the station over the first part of the day, the plurality of modules comprising a comparison module, the comparison module being configured to compare the measured distribution and the determined local time distribution of passengers exiting the network over the first part of the day, and to:
 - validate the measured local time distribution of passengers exiting the network over the first part of the day if the difference between the measured local time distribution and the determined local time distribution of passengers exiting the network over the first part of the day is less than or equal to a predetermined threshold difference;
 - generate an alert signal if the difference between the measured local time distribution of passengers exiting the network over the first part of the day and the determined local time distribution of passengers exiting the network over the first part of the day is greater than a predetermined threshold difference.

The invention further relates to a monitoring method, implemented by a monitoring system as mentioned hereinabove, comprising the following steps:

- acquisition of an overall time distribution of passengers entering the whole transport network over the first part of a day;
- acquisition of a local number of passengers entering the network at a station of the network on a second part of a day;
- determination of a local time distribution of passengers exiting the network at the station over the first part of the day, as a function of the local number of incoming passengers, acquired over the second part of the day, and the overall time distribution of incoming passengers, acquired over the first part of the day.

The invention further relates to a computer program including software instructions which, when executed by a data processing unit, implement a method as aforementioned.

Other features and advantages of the invention will appear upon reading hereinafter the description of the embodiments of the invention, given only as an example, and making reference to the following drawings:

Figures 1, a flowchart representing a monitoring system according to an embodiment of the invention;

Figure 2, a flowchart representing a monitoring system according to an embodiment of the invention differing from same shown in Figure 1;

Figure 3, a schematic representation of a determination of a local time distribution of passengers exiting the network at a station, implemented by the systems shown in figures 1 and 2; and

5 Figure 4, a flowchart representing a monitoring method implemented by the systems shown in Figures 1 and 2.

Figure 1 shows a system 10 for monitoring the movement of passengers in a transport network.

The transport network is e.g. a public transport network such as e.g. a bus network, a tramway network or a metro network.

10 The transport network comprises, more particularly, a plurality of stations connected to each other by tracks, at least one vehicle being configured to travel on the tracks and to allow passengers of the transport network to move between stations of the transport network.

15 The transport network comprises, for each station, at least one entrance and at least one exit of the network, through which each user can enter or exit the network. Hereinafter in the description, entrance refers to all the entrances to a station and exit refers to all exits from a station.

In one embodiment, the entrance also serves as exit, and vice versa.

20 The entrance and/or exit of the transport network is e.g. formed by at least one door or at least one gate of the transport network. The entrance and/or exit of the transport network is e.g., formed by a gate of the station, a passenger entering the network at a station through the gate of the station and/or exiting the network at the station through the gate of the station.

25 The entrance and/or exit of the transport network is, according to another example, formed by at least one door of the vehicle. A passenger then enters the network at a station by passing through the door of the vehicle when the vehicle is in the station and/or exits the network at the station by passing through the door of the vehicle when the vehicle is in the station.

30 The monitoring system 10 comprises a plurality 12 of modules which can be executed by at least one processor 14. The plurality 12 of modules comprises an overall acquisition module 16, a local acquisition module 18 and a determination module 20.

The monitoring system 10 further preferably comprises a first entrance control device 22 and at least a second entrance control device 24.

35 The first entrance control device 22 is arranged in a station. The first entrance control device 22 is e.g. connected to the entrance(s) of the transport network of the station.

When the entrance is formed by a gate of the station, the first entrance control device 22 is e.g. connected or integrated into the gate so as to control the entrances.

When the entrance is formed by a door of the vehicle, the first entrance control device 22 corresponds e.g., to a mobile entrance control device integrated into the vehicle and controlling the entrances into the vehicle, when the vehicle is at the station.

The first entrance control device 22 is formed e.g. by an optical sensor, by a camera, or by a motion sensor connected to a moving entrance obstacle.

The first entrance control device 22 is configured to count the number of passengers entering the network at the station. The first entrance control device 22 is also configured to communicate the number of counted passengers to the local acquisition module 16.

In a preferred embodiment, the first entrance control device 22 is further configured to measure a time distribution of the number of passengers entering the network at the station, from the measured number of passengers entering the network at the station over time.

In such preferred embodiment, the first entrance control device 22 is configured e.g. to count the number of passengers entering the network at the station over measurement time intervals, to measure the time distribution of the number of passengers entering the network at the station. The first entrance control device 22 is configured e.g. to count the number of passengers entering the network at the station over successive time intervals of preferably less than 1 hour, e.g. less than 1 minute or less than 1 second. In a variant, the entrance control device 22 is configured to time stamp each entrance into the network so as to measure the time distribution of the number of passengers entering the network at the station.

The second entrance control device 24 is arranged in the transport network. More particularly, the second entrance control device 24 is arranged at another station of the transport network, the other station differing from the station of the transport network where the first entrance control device 22 is arranged.

Each other station of the transport network then preferably comprises a second entrance control device 24.

The second entrance control device 24 is preferably similar to the first entrance control device 22, the second entrance control device 24 differing e.g. from the first entrance control device 22 only in that same is arranged at another station of the transport network.

The first 22 and second 24 entrance control devices are configured to measure together the overall time distribution of passengers entering the whole transport network. As seen hereinabove, the first 22 and the second 24 entrance control devices are e.g. each

configured to measure the overall time distribution of passengers entering the network at a station of the network, the devices 22, 24 being thereby configured to measure together the overall time distribution of passengers entering the whole transport network.

5 It is thereby understood that the overall time distribution corresponds to the distribution of passenger entrances throughout the transport network over time, resulting e.g. from the measurement of the number of passengers entering the network over successive measurement intervals or from the timestamping of passengers entering the network.

10 The first 22 and the second 24 entrance control devices are further configured to communicate the overall time distribution to the overall acquisition module 18.

The overall acquisition module 18 is configured to acquire an overall time distribution DGI1 of passengers entering the whole transport network over a first part P1 of a day J.

15 For example, a day J is defined according to the operation of the public transport network. For example, a day J begins at the opening of the public transport network and ends at the closing of the public transport network. In a variant, a day lasts twenty-four hours and corresponds to a calendar day. It will be understood from the description that a day is any day, the term day J applying to one chosen day.

20 The overall acquisition module 18 is further preferably configured to acquire an overall time distribution DGI2 of passengers entering the whole transport network over a second part P2 of the day J.

The first part P1 of day J and the second part P2 of day J together form the day J.

25 The overall acquisition module 18 is e.g. logically connected to the first 22 and second 24 entrance control devices, by wire link or by radio waves, and is configured to acquire the overall time distribution DGI1 of passengers entering the first part P1 of day J, and, where appropriate, the overall time distribution DGI2 of passengers entering the second part P2 of day J, from the first 22 and the second 24 entrance control devices.

30 In a variant (not shown), the overall acquisition module 18 is configured to acquire the overall time distribution DGI1, and, where appropriate, the overall time distribution DGI2, from a database where previously measured overall time distributions DGI1, DGI2 are stored.

The local acquisition module 16 is configured to acquire a local number NL2 of passengers entering the network at a station of the network over the second part P2 of day J.

The local acquisition module 16 is also preferably configured to acquire a local number NL1 of passengers entering the network at the station of the network over the first part P1 of day J.

The local acquisition module 16 is e.g. logically connected to the first entrance control device 22, by wire link or by radio waves, and is configured to acquire the local number NL2 of passengers entering the network at the station of the network over the second part P2 of day, and, where appropriate, the local number NL1 of passengers entering the network at the station of the network over the first part P1 of day, from the first entrance control device 22.

In a variant (not shown), the local acquisition module 16 is configured to acquire the local number NL2, and, where appropriate, the local number NL1, from a database where previously measured local numbers NL1, NL2 are stored.

The first part P1 of day and the second part P2 of day are preferably defined according to an overall number of passengers entering the whole transport network. The first part P1 of day and the second part P2 of day are defined in particular in such a way that an overall number of passengers entering the whole transport network is substantially equal over the first part P1 of day and over the second part P2 of day.

The first part P1 of day and the second part P2 of day are e.g. defined on the basis of the overall time distribution of passengers entering the whole transport network over a whole day J by the overall acquisition module 18.

The determination module 20 is configured to determine a local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day as a function of the local number NL2 of incoming passengers, acquired over the second part P2 of day and of the distribution overall time DGI1 of incoming passengers, acquired over the first part P1 of day.

The determination module 20 is further configured to determine the local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day as a function of an average travel time M.

The average travel time M is obtained e.g. by means of statistical studies of passenger travels on the network. The average travel time M is e.g. stored in the determination module 20 or supplied to the determination module by a module (not shown).

To determine the local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day, the determination module 20 is configured e.g. to calculate an overall time distribution DGO1 of passengers exiting the whole transport network over the first part of the day.

The overall time distribution DGO1 of the whole transport network over the first part P1 of day corresponds e.g. and as illustrated in the graph at the top of Figure 3, to the overall time distribution of incoming passengers DG1 acquired over the first part P1 of day, by the overall acquisition module 18, time-shifted from the average travel time M toward the future.

The determination module 20 is e.g. further configured to calculate a local influx coefficient C2 for the second half-day P2.

The coefficient C2 corresponds e.g. to the ratio between the local number of incoming passengers NL2 acquired over the second part P2 of day and the overall number NGI2 of incoming passengers over the second part P2 of day. In other words, $C2 = NL2/NGI2$.

As illustrated on the left of the graphs in Figure 3, the determination module 20 is e.g. further configured to calculate the local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day, by factoring the overall time distribution DGO1 of outgoing passengers calculated over the first part P1 of day by the coefficient C2 of local influx calculated for the second part P2 of day. In other words, $DL1 = C2 \times DGO1$. Since the distribution DL1 is a local time distribution, it will be understood that one can write also $DL1(t) = C2 \times DGO1(t)$.

In other words, the local time distribution DL1 of outgoing passengers over the first part P1 of day is calculated by the determination module 20 e.g. by multiplying the overall time distribution DGO1 of outgoing passengers over the first part P1 of day, by the local influx coefficient C2 for the second part of the day, the coefficient C2 as such being calculated by the determination module 20 as a function of the local number NL2 of incoming passengers, acquired by the local acquisition module 16 over the second part P2 of day.

Furthermore, the determination module 20 is preferably configured to determine a local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day as a function of the local number NL1 of incoming passengers, acquired over the first part P1 of day and of the overall time distribution DGI2 of incoming passengers, acquired over the second part P2 of day.

In the same way as described hereinabove for determining the local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day, the determination module 20 is e.g. configured to determine the local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day as a function of an average travel time M (see in particular the right-hand of the graphs in Figure 3). More particularly, and analogously to what has been described for determining the local time

distribution DL1 of passengers exiting the network at the station over the first part P1 of day, the determination module 20, for determining a local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day, is configured to:

- calculate an overall time distribution DGO2 of passengers exiting the whole transport network over the second part P2 of day, said overall time distribution DGO2 of outgoing passengers corresponding to the overall time distribution DGI2 of incoming passengers, acquired over the second part P2 of day, shifted by the average travel time M;
- calculate a local influx coefficient C1 for the first part of the day, the local influx coefficient C1 corresponding to the ratio between the local number NL1 of incoming passengers, acquired over the first part P1 of day, and the overall number NGI1 of incoming passengers over the first part P1 of day; and
- calculate the local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day, by factoring the overall time distribution of outgoing passengers DGO2 calculated over the second part P2 of day by the coefficient C1 of local influx calculated for the first part P1 of day.

As illustrated in Figure 1, the system 10 preferably further comprises a display screen 26 connected to the determination module 20. The display screen 26 is more particularly configured to display the local time distribution DL1, DL2 of passengers exiting the network at the station, determined by the determination module 20.

As seen above, the determination module 20 is e.g. configured to determine in parallel a local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day and a local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day.

The display screen 26 is then configured e.g. to display the determined local time distribution DL1, DL2 of passengers exiting the network at the station over the first P1 and the second P2 part of the day, or in other words the whole day J, as illustrated in dotted lines on the bottom graph in Figure 3.

In a particular embodiment illustrated in Figure 2, the monitoring system 10 comprises a device 28 for measuring a measured local time distribution DLM1 of passengers exiting the network at the station over the first part P1 of day, and e.g. a measured local time distribution DLM2 of passengers exiting the network at the station over the second part P2 of day. The device 28 for measuring a measured local time distribution DLM1, DLM2 is e.g. similar to the first 22 entrance control device and/or the second 24 entrance control device(s).

According to such embodiment, the plurality 12 of modules of the system 10 comprises, in addition, a comparison module 30, configured to compare said measured

distribution DLM1 of passengers exiting the network at the station over the first part P1 of day and the determined local time distribution DL1 of passengers exiting the network over the first part P1 of day. The comparison module is further preferably configured to compare said measured distribution DLM2 of passengers exiting the network at the station over the second part P2 of day and the determined local time distribution DL2 of passengers exiting the network over the second part P2 of day.

The comparison module 30 is preferably configured to validate the measured local time distribution DLM1 of passengers exiting the network over the first part P1 of day, and, where appropriate, the measured local time distribution DLM2 of passengers exiting the network over the second part P2 of day, if the difference between said measured time distribution DLM1, DLM2 and the determined local time distribution of passengers DL1, DL2 is less than or equal to a predetermined threshold difference.

The comparison module 30 is preferably configured to generate an alert signal if the difference between the measured local time distribution DLM1 of passengers exiting the network over the first part P1 of day, and, where appropriate, the measured local time distribution DLM2 of passengers exiting the network over the second part P2 of day, and the calculated distribution DL1, where appropriate DL2, is greater than a predetermined threshold difference.

In the example shown Figures 1 and 2, the monitoring system 10 comprises a data processing unit formed e.g. of a memory 52 and of a processor 14 associated with the memory 52.

In the examples shown in Figures 1 and 2, the acquisition module 16, the overall acquisition module 18, the determination module 20 and, in the example shown in Figure 2, the comparison module 30 are each produced in the form of a software program, or of a software brick, which can be run by the processor 14.

The memory 52 of the monitoring system 10 is then apt to store software for acquiring an overall time distribution of incoming passengers, software for acquiring a local number of incoming passengers and software for determining a local time distribution of outgoing passengers. In the example shown in Figure 2, the memory is also apt to store software for comparing the measured local distribution and the determined local distribution.

The processor 14 is then apt to execute each of the software programs among the local acquisition software program, the overall acquisition software program, the determination software program, and, in the example shown in Figure 2, the comparison program.

In a variant (not shown) the local acquisition module 16, the overall acquisition module 18, the determination module 20 and, where appropriate, the comparison module

30, are each produced in the form of a programmable logic component, such as an FPGA (*Field Programmable Gate Array*), or further of a dedicated integrated circuit, such as an ASIC (*Application Specific Integrated Circuit*).

5 When the monitoring system 10 is produced in the form of one or a plurality of software programs, i.e. in the form of a computer program, same is further apt for being recorded on a computer-readable medium (not shown). The computer-readable medium is e.g. a medium apt to store the electronic instructions and to be coupled to a bus of a computer system. As an example, the readable medium is an optical disk, a magneto disk, a ROM memory, a RAM memory, any type of non-volatile memory (e.g. EPROM, EEPROM,
10 FLASH, NVRAM), a magnetic card or an optical card. A computer program containing software instructions is then stored on the readable medium.

With reference to Figure 4, a monitoring method 100, implemented by a monitoring system 10 as described hereinabove, will now be presented.

15 During a first acquisition step 110, the monitoring system 10, and more particularly the overall acquisition module 18, acquires an overall time distribution DGI1 of passengers entering the whole transport network over a first part P1 of a day J.

During the first acquisition step 110, the monitoring system 10, and in particular the overall acquisition module 18, further acquires e.g. an overall time distribution DGI2 of passengers entering the whole transport network over a second part P2 of a day J.

20 During a second acquisition step 120, e.g. taking place simultaneously with the first acquisition step 110, the monitoring system 10 and more particularly the local acquisition module 16, acquires a local number NL2 of passengers entering the network at a station of the network, over the second part P2 of day J.

25 During the second acquisition step 120, the monitoring system 10 and more particularly the local acquisition module 16, acquires e.g. a local number NL1 of passengers entering the network at a station of the network, over the first part P1 of the day J.

During a determination step 130 subsequent to the first 110 and second 120 acquisition steps, the monitoring system 10 and more particularly the determination module 20 determines a local time distribution DL1 of passengers exiting the network at the station
30 over the first part P1 of day J, as a function of a local number of incoming passengers NL2 acquired over the second part P2 of day J and to the overall time distribution DGI1 of incoming passengers, acquired over the first part P1 of day J.

During the determination step 130, the monitoring system 10 and more particularly the determination module 20 further determines e.g. a local time distribution DL2 of
35 passengers exiting the network at the station over the second part P2 of day J, as a function the local number of incoming passengers NL1 acquired over the first part P1 of day J and

of the overall time distribution DGI2 of incoming passengers, acquired over the second part P2 of day J.

5 A subsequent display step (not shown) is e.g. implemented by the display screen 26, the display screen 26 then displaying the local time distribution DL1 of passengers exiting the network at the station over the first part P1 of day J, and e.g. the local time distribution DL2 of passengers exiting the network at the station over the second part P2 of day J.

10 The separation of day J into parts of day P1, P2 as described hereinabove, and the determination of the local time distribution DL1, DL2 as a function of the average travel time is particularly advantageous for a precise calculation of the local time distribution DL1, DL2.

The display of the local time distribution DL1, DL2 makes possible a direct use of the local time distribution DL1, DL2 for activities of adaptation of the transport network to the local time distribution DL1, DL2.

15 The particular example wherein the system 10 comprises a device 28 for measuring a local time distribution of passengers exiting the network at the station and wherein the plurality 12 of modules comprising a comparison module 30 is particularly advantageous for improving the reliability of the system 10 at low cost.

14
CLAIMS

1. A system (10) for monitoring the movement of passengers in a transport network, comprising a plurality of modules (12) which can be executed by at least one processor (14), the plurality of modules (12) comprising:

- an overall acquisition module (18) configured to acquire an overall time distribution (DGI1) of passengers entering the whole transport network over a first part (P1) of a day (J);
- a local acquisition module (16), configured to acquire a local number (NL2) of passengers entering the network at a station of the network on a second part (P2) of the day (J);
- a determination module (20), configured to determine a local time distribution (DL1) of passengers exiting the network at the station over the first part (P1) of day, as a function of the local number (NL2) of incoming passengers, acquired over the second part (P2) of day and the overall time distribution (DGI1) of incoming passengers, acquired over the first part (P1) of day (J).

2. The monitoring system (10) of claim 1, wherein the first part (P1) of day and the second part (P2) of day are defined in such a way that an overall number of passengers entering the whole transport network is substantially equal over the first part of the day and over the second part of the day.

3. A monitoring system (10) according to claim 1 or 2, wherein the determination module (20) is further configured to determine the local time distribution (DL1) of passengers exiting the network at the station over the first part (P1) of day as a function of an average travel time (M).

4. The monitoring system (10) according to claim 3, wherein the local acquisition module (16) is further configured to acquire a local number (NL1) of passengers entering the network at the network station over the first part (P1) of day, the determination module (20), in order to determine a local time distribution (DL1) of passengers exiting the network at the station over the first part (P1) of day, being configured to:

- calculate an overall time distribution (DGO1) of passengers exiting the whole transport network over the first part (P1) of day, said overall time distribution (DGO1) of outgoing passengers corresponding to the overall time distribution of incoming

passengers (DGI1) acquired over the first part (P1) of day, shifted by the average travel time (M);

- calculate a local influx coefficient (C2) for the second part (P2) of day, the local influx coefficient (C2) corresponding to the ratio between the local number (NL2) of incoming passengers, acquired for the second part (P2) of day and the overall number of incoming passengers (NGI2) over the second part (P2) of day; and
- calculate the local time distribution (DL1) of passengers exiting the network at the station over the first part (P1) of day, by factoring the overall time distribution (DGI1) of incoming passengers calculated over the first part (P1) of day by the local influx coefficient (C2) calculated for the second part (P2) of day.

5. The monitoring system (10) according to any of the preceding claims, wherein:

- the overall acquisition module (18) is further configured to acquire an overall time distribution (DGI2) of passengers entering the whole transport network over the second part (P2) of day;
- the local acquisition module (16) is configured to acquire a local number (NL1) of passengers entering the network at the network station over the first part (P1) of day;
- the determination module (20) is further configured to determine a local time distribution (DL2) of passengers exiting the network at the station over the second part (P2) of day, as a function of the local number (NL1) of incoming passengers, acquired over the first part (P1) of day and the overall time distribution (DGI2) of incoming passengers, acquired over the second part (P2) of day.

6. The monitoring system (10) according to any of the preceding claims, comprising a display screen (26) connected to the determination module (20), the display screen (26) being configured to display the determined local time distribution (DL1, DL2) of passengers exiting the network at the station on the part (P1, P2) of the day.

7. The monitoring system (10) according to any of the preceding claims, comprising:

- a first entrance control device (22) arranged at the station, said first entrance control device (22) being configured to count the number of passengers entering the network at the station and to communicate said number of passengers to the local acquisition module (16);

- at least one second entrance control device (24) arranged in the transport network, the first (22) and the at least one second (24) entrance control device are configured to measure together the overall time distribution of passengers entering the whole transport network and to communicate the overall time distribution to the overall acquisition module (18).

8. The monitoring system (10) according to any of the preceding claims, comprising a device for measuring (28) a measured local time distribution (DLM1) of passengers exiting the network at the station over the first part (P1) of day, the plurality of modules (12) comprising a comparison module (30), the comparison module (30) being configured to compare said measured distribution (DLM1) and the determined local time distribution (DL1) of passengers exiting the network over the first part (P1) of day, and to:

- validate the measured local time distribution (DLM1) of passengers exiting the network over the first part (P1) of day if the difference between said measured local time distribution (DLM1) and the determined local time distribution (DL1) of passengers exiting the network over the first part (P1) of day is less than or equal to a predetermined threshold difference;
- generate an alert signal if the difference between the measured local time distribution (DLM1) of passengers exiting the network over the first part (P1) of day and the determined local time distribution (DL1) of passengers exiting the network over the first part (P1) of day is greater than a predetermined threshold difference.

9. A monitoring method (100) implemented by a monitoring system (10) according to any of claims 1 to 8, comprising the following steps:

- acquisition (110) of an overall time distribution (DGI1) of passengers entering the whole transport network over a first part (P1) of a day (J);
- acquisition (120) of a local number (NL2) of passengers entering the network at a station of the network over a second part (P2) of the day (J);
- determination (130) of a local time distribution (DL1) of passengers exiting the network at the station over the first part (P1) of day, as a function of the local number (NL2) of incoming passengers, acquired over the second part (P2) of day and the overall time distribution (DGI1) of incoming passengers, acquired over the first part (P1) of day.

10. A computer program including software instructions which, when executed by a data processing unit (50), implement a method (100) according to claim 9.