

DYNAMIC ROUTING METHOD AND SYSTEM

TECHNICAL FIELD

This invention relates generally to a dynamic routing method and system for routing of
5 vehicle travel routes.

Background

There is a growing demand for transportation, such as buses and other multi-passenger
vehicles, to carry passengers or riders from numerous origins to a variety of destinations.

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A common goal for transportation providers is to meet the varying demands for buses and
other vehicles. Unlike public transportation that has long provided buses that travel along
predefined routes and pickup and drop off passengers along the route, private transportation,
or on-demand transportation, are subjected to pick-up and drop-off locations that vary based
15 on passengers being assigned to the vehicle. This results in a less than optimized route that
see transportation providers being unable to provide accurate pick-up and drop-off time
estimates. Further, the ad-hoc accommodation of additional passengers to will require the
driver of the bus to estimate the time duration impact to the vehicle route based on the
driver's experience. This approach results in inaccurate estimates and not ideal when
20 passengers have a schedule to keep.

To exacerbate the situation, parents of school-going passengers are often not updated on or
are provided with inaccurate pick-up or drop-off time estimates caused by the by ad-hoc
change to the vehicle route. Traffic delays during travel of the vehicle along the route
25 further contributes to the uncertainty, causing unnecessary worry to parents. Therefore,
there exists a need for a solution to address the foregoing problems.

Summary

In accordance with a first aspect of the invention, there is disclosed a dynamic routing method comprising retrieving a first reference travel route of a first vehicle, the first
5 reference travel route comprising a first plurality of reference geo-locations, receiving travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger, and determining compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the
10 candidate passenger identifier is incorporated with the first reference travel route. The dynamic routing method further comprising one of accepting and reassigning the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.

15 In accordance with a second aspect of the invention, there is disclosed a dynamic routing system comprising a data storage module, a data staging module and a processing module. The data staging module is for retrieving a first reference travel route of a first vehicle, the first reference travel route comprising a first plurality of reference geo-locations from the data storage module, and for receiving travel details of a candidate passenger identifier, the
20 candidate passenger identifier being indicative of a candidate passenger. The processing module is for determining compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the candidate passenger identifier is incorporated with the first reference travel route, and for one of accepting and reassigning
25 the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.

In accordance with a third aspect of the invention, there is disclosed a machine-readable medium having stored therein a plurality of programming instructions, which when
30 executed, the instructions cause the machine to retrieve a first reference travel route of a first

vehicle, the first reference travel route comprising a first plurality of reference geo-locations, receive travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger, determine compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle
5 with first operating requirements associated with the first vehicle when the travel details of the candidate passenger identifier is incorporated with the first reference travel route, and one of accept and reassign the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.

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Brief Description of the Drawings

FIG. 1 shows a system diagram of a dynamic routing system according to an aspect of the invention;

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FIG. 2 shows a process flow diagram of a dynamic routing method for being implemented by the dynamic routing system of FIG. 1 according to an aspect of the invention;

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FIG. 3 shows a system diagram of the dynamic routing system of FIG. 1 being adapted for use with multiple vehicles via multiple crew computing devices;

FIG. 4 shows a process flow diagram of the dynamic routing method of FIG. 2 according to another aspect of the invention;

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FIG. 5 shows a process flow diagram of the dynamic routing method of FIG. 2 with various process pathways for determining compliance with operating requirements and for accepting and reassigning candidate passenger identifier based on outcome of compliance being determined; and

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FIG. 6 shows a data flow diagram of the dynamic routing system of FIG. 1.

Detailed Description

An exemplary embodiment of the present invention, a dynamic routing method 100 and a dynamic routing system 20 for implementing the dynamic routing method 100, is described hereinafter with reference to FIG. 1 to FIG. 6.

Referring to FIG. 1 and FIG. 2, the dynamic routing system 20 comprises a data storage module 22, a data staging module 24 and a processing module 26. It is preferred that the data storage module 22, the data staging module 24 and the processing module 26 are in signal communication with one another. The dynamic routing system 20 further comprises a geo-location module 28 and a user interface (UI) module 30.

It is preferred that the processing module 26 is in signal and data communication with the UI module 30 and the geo-location module 28. The UI module 30 and the processing module 26 can be combined to form a structurally intercoupled unitary system, for example an in-vehicle dashboard unit or navigation system, functioning independently or in cooperation with other unitary systems. Communication between the UI module 30 and the processing module 26 can occur through wired or wireless means. When employed as a unitary system, it is preferred that communication between the UI module 30 and the processing module 26 occur through wired means. In configurations where the processing module 26 and the UI module 30 is structurally decoupled, the processing module 26 is preferably also in signal and data communication with the UI module 30 over a network 32. In such a configuration, the processing module 26, the data storage module 32 and the data staging module 24 constitutes a backend system 34 which may reside, at least in part, on a cloud platform. The UI module 30 and the geo-location module 28 can constitute components of a crew computing device 36, for example a smart device such as a smart phone. The crew computing device 36 may be used by any crew of the vehicle including a driver, a driver's assistant or an attendant of the vehicle, for example the first vehicle 40. The crew computing device 36 preferably has a pre-installed native or hybrid app for enabling communication with the dynamic routing system 20.

The backend system 24 can represent various forms of server systems including, but not limited to a web server, an application server, a proxy server, a network server, or a server farm. In some implementations, the dynamic routing system 20 may communicate wirelessly through a communication interface (not shown), which may include digital signal processing circuitry where necessary. The communication interface may provide for communications under various modes or protocols.

The network 32 can be a large computer network, such as a local area network (LAN), wide area network (WAN), the Internet, a cellular network, or a combination thereof connecting any number of mobile clients, fixed clients, and/or servers. In some implementations, each client (e.g., the UI module 22) can communicate with one or more of the control computer systems 28 via a virtual private network (VPN), Secure Shell (SSH) tunnel, or other secure network connection. In some implementations, the network 32 can include the Internet and a wireless service network. In other implementations, the network 32 may include a corporate network (e.g., an intranet) and one or more wireless access points.

The geo-location module 28 uses one of a combination of a GPS module, an A-GPS module, Bluetooth beacon module and a WiFi module geo-location thereof and hence indicates the geo-location of a vehicle in which the geo-location module 28 resides.

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In an implementation of the dynamic routing system 20 as further shown in FIGS. 3 to 6, the dynamic routing method 100 initiates with the data staging module 24 retrieving a first reference travel route 38 of a first vehicle 40 from the data storage module 22 in a step 110. The first reference travel route comprises a first plurality of reference geo-locations 42. Next, the data staging module 24 receives travel details 44 of a candidate passenger identifier 46 provided thereto from by the data storage module 24, the crew computing device 36 or a user computing device 48, for example a smart device such as a smart phone, in a step 112. The candidate passenger identifier 46 is indicative of a candidate passenger. The user computing device 48 preferably has a pre-installed native or hybrid app for enabling communication with the dynamic routing system 20.

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The processing module 26 then determines compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle 40 with first operating requirements 50 associated with the first vehicle 40 when the travel details 44 of the candidate passenger identifier 48 is incorporated with the first reference travel route 38 in a step 114. The processing module 26 further one of accept and reassign the candidate passenger identifier 48 based on outcome of compliance with the first operating requirements 50 being determined in a step 116.

The candidate passenger is provided for assessment to consider suitability for adding to a travel route associated with a particular vehicle or bus. As aforesaid, the travel route associated with the particular vehicle or bus corresponds with the first reference travel route 38 of the first vehicle 40. The candidate passenger is preferably identified by the candidate passenger identifier 46 which may be a name or a code generated to uniquely identify the candidate passenger. The travel details 44 will indicate, potentially among other details, a pick-up location, or pick-up geo-location, and a drop-off location, or drop-off geo-location, of the candidate passenger identifier 46 and consequently of the candidate passenger. As adding the candidate passenger to the travel route of the vehicle will affect the travel route of the vehicle, operating requirements of the vehicle, in this case the first operating requirements 50 of the first vehicle 40 has to be met before the candidate passenger may be considered for being added to the travel route of a particular vehicle. One or more candidate passengers may be assessed for suitability at the same time or in a sequential fashion. Where multiple vehicles are available, multiple candidate passengers may be assessed for suitability for multiple vehicles, in tandem.

Referring to FIG. 4 and FIG. 5, when suitability is determined, the travel route of a vehicle may be updated with the travel details of the candidate passenger identifier. Hence, in the step 116 of accepting the candidate passenger identifier 46 based on outcome of the compliance with the first operating requirements 50 comprises a step 118 of updating the

first reference travel route 38 with the travel details 44 of the candidate passenger identifier 46.

5 The step 114 of determining compliance with first operating requirements 50 associated with the first vehicle 40 based on at least one of total duration of the reference travel route and total number of passengers of the first vehicle 40 can comprise a step 120 of assessing suitability of the size of the first vehicle 40 based the travel details 44 of the candidate passenger identifier 46, and a step 122 of one of accepting and reassigning the candidate passenger further based on the suitability of the size of the first vehicle 40 according to
10 travel details 44 of the candidate passenger identifier 46.

In an exemplary implementation of the dynamic routing method 100, the step 114 of determining compliance with first operating requirements 50 associated with the first vehicle 40 comprises a step 130 of retrieving a first passenger list 52. The first passenger
15 list 52 is descriptive of a first plurality of passenger identifiers 54 with at least two of the first plurality of reference geo-locations 42 being associated with each of the first plurality of passenger identifiers 54. Each of the first plurality of passenger identifiers 54 is indicative of a passenger being assigned to the first vehicle 40. Next, in a step 132, a first temporary travel route 56 is generated from a first plurality of temporary geo-locations 58
20 comprising the first plurality of reference geo-locations 42 and at least one candidate geo-location 60. The travel details 44 of the candidate passenger identifier 46 comprises and indicates the at least one candidate geo-location 60. Compliance of at least one of total duration of the first temporary travel route 56 and total number of passengers of the first vehicle 40 between each adjacent pair of the plurality of temporary geo-locations 58 along
25 the first temporary travel route 56 with first operating requirements 50 associated with the first vehicle 40 is then determined in a step 134. The at least one candidate geo-location 60 is at least one of a pick-up location and a drop-off location associated with the candidate passenger identifier 46 of the candidate passengers. The first plurality of passenger identifiers are associated with passengers who have already been assign to the first vehicle
30 40.

Following the step 134, the step 116 of accepting the candidate passenger identifier 46 based on outcome of the compliance with the first operating requirements 50 being determined comprises a step 136 of updating the first plurality of reference geo-locations 42 with the first plurality of temporary geo-locations 58 and the first reference travel route 38 with the first temporary travel route 56, and a step 138 of adding the candidate passenger identifier 46 to the first passenger list 52 in response to compliance with the first operating requirements 50. Hence, the candidate passenger identifier 46 is accepted in response to compliance with the first operating requirements 50 being determined.

Further following the step 134, should the first temporary travel route 56 be determined as not being in compliance with the first operating requirements 50, the step 116, reassigning the candidate passenger based on outcome of the compliance with the first operating requirements 50 being determined comprises a step 140 of generating a second temporary travel route 62 from a second plurality of temporary geo-locations 64 comprising a second plurality of reference geo-locations 66 and the at least one candidate geo-location 60. The second plurality of reference geo-locations 64 constituting a second reference travel route 68 associated with a second vehicle 70. Next, compliance of at least one of total duration of the second temporary travel route 62 and total number of passengers of the second vehicle 70 between each adjacent pair of the plurality of temporary geo-locations along the temporary travel route with second operating requirements 72 associated with the second vehicle 70 is assessed in a step 142. In response to to compliance with the second operating requirements 72 being determined, the second plurality of reference geo-locations 66 is updated to include the second plurality of temporary geo-locations 64 and the second reference travel route 68 with the second temporary travel route 62 in a step 144. Further, the candidate passenger identifier 46 is added to a second passenger list 74 in a step 146 in response to compliance with the second operating requirements 72 being determined. The second passenger list 74 is descriptive of a second plurality of passenger identifiers 76 with at least two of the second plurality of reference geo-locations 66 being associated with each of the second plurality of

passenger identifiers 76. Each of the second plurality of passenger identifiers 76 being indicative of a passenger being assigned to the second vehicle 70.

5 Preferably, the dynamic routing system 20 further comprises a command centre 80 for controlling and monitoring processes implemented thereby. Hence, in the event that the candidate passenger identifier 46, and consequently the candidate passenger, has not been accepted by one or more vehicles, for example the first vehicle 40, the step 116 of reassigning the candidate passenger identifier 46 based on outcome of the compliance with the first operating requirements 50 being determined comprises a step 150 of generating an
10 alert for non-compliance with the first operating requirements 50, with the alert is communicable to at least one computing device for display on user-interface (UI) thereof. The at least one computing device can be one or more of a computing terminal of the command centre 80, the crew computing device 36 and the user computing device 48.

15 Preferably, the dynamic routing method 100 further comprises a step 160 of generating a trip task for the first reference travel route 38. The trip task is indicative of the time of day and the nature of a vehicular trip that is generally along a travel route such as the first reference travel route 38. Hence, the trip task may indicate that a particular trip is, for example, for a trip to an organization or a workplace in the morning at the start of the day,
20 sending of students back home from school, or for a trip to and from an event or activity location.

The trip task will also be indicative of and comprises at least one of the first plurality of reference geo-locations 42 and profile details of the first plurality of passenger identifiers 54
25 for the first vehicle 40, and the corresponding plurality of passenger identifiers for other vehicles. The profile details comprise names, addresses, contact details and other descriptors of passengers associated with the first plurality of passenger identifiers 54.

During performance of the trip task, the crew of the vehicle, for example driver of the first
30 vehicle 40, will interact with the driver computing device 36 for communicating with the

dynamic routing system 20, preferably through the command centre 80, for requesting initiation of instruction and navigation of the first reference travel route 38 in a step 170.

5 The dynamic routing system 20, or an app on the crew computing device 36, may initiate a check-list on a user-interface (UI) of a crew computing device 36 in a step 172. It is only with acknowledgement of the check-list on the crew computing device 36 by the driver before navigation for the first reference travel route 38 will initiate in a step 174.

10 The check-list requirement is implemented for the safety of crew and passengers on-board any of the vehicles and can include acknowledgement requirements for pre-trip inspection checks, on-board camera functionality checks and a reminder to not use any mobile devices while driving.

15 Once navigation for the trip defined by the first reference travel route 38 has been initiated in the step 174, the command centre 80, through communication with the driver computing device 36, will track actual geo-location of the first vehicle 40 during travel thereof to generate an actual travel route in a step 180. The actual travel route of the first vehicle 40 is one of generated progressively during travel thereof and generated after completion of travel of the first vehicle 40 to all the first plurality of reference geo-locations 42.

20 Further, in a step 182, time of the first vehicle 40 at at least one of the first plurality of reference geo-locations 42 and speed of first vehicle 40 at various points along the actual travel route are recorded by the crew computing device 36 for subsequent provision to the command centre 80 or in substantial real-time by the command centre 80 via the crew
25 computing device 36.

In a step 184, the command centre 80 identifies deviation of actual travel route from the first reference travel route 38 and calculating delay duration contributed by the deviation and generates an alert comprising the delay duration in a step 184 in response to the deviation
30 being identified.

Additionally or alternatively, the command centre 80 calculates estimated arrival time for each of the first plurality of reference geo-locations 42, compares actual arrival time of the first vehicle 40 to the estimated arrival time at each of the first plurality of reference geo-locations 42, and generates an alert comprising an estimated delay duration in a step 186 in response to the difference between the estimated arrival time and the actual arrival time is beyond a pre-defined delay limit.

The alerts will allow personnel manning or overseeing the command centre 80 to contact the driver of the vehicle via the crew computing device 36 for which the alert relates to find out the cause of the delay, whether the delay will persist and whether assistance is required. The alerts will also allow users, for example parents or primary contacts of passengers in the affected vehicle, to be informed about and updated on the delay via the user computing device 48.

Hence, the user computing device 48 and its pre-installed app will permit all users, specifically parents of children assigned to a vehicle, to monitor the route, pick-up and drop-off, attendance for their children in real-time. Feedback in general or specific to a trip may be provided by users via the user computing device 48.

Similarly, the crew computing device 36 and its pre-installed app will permit will allow the dynamic routing system 20 to monitor the start/end destinations, route taken by the vehicle, speed of the vehicle, timing of the vehicle when leaving the pick-up/drop-off destinations and when arriving at the end destinations, for example the reference geo-locations. These will also enable the dynamic routing system 20 to ensure expeditious reporting of incidents or delays from unforeseen road conditions to the command centre 80. Further, alerts and the information and data received for deriving the alerts can be used to generate management and operational dashboards at the command centre 80.

Similarly, the route value method 100 may be implemented through use of a machine in communication with or having a machine-readable medium having stored therein a plurality of programming instructions, which when executed, the instructions cause the machine to retrieve a first reference travel route of a first vehicle, the first reference travel route comprising a first plurality of reference geo-locations, receive travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger, determine compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the candidate passenger is incorporated with the first reference travel route, and one of accept and reassign the candidate passenger based on outcome of compliance with the first operating requirements being determined.

Aspects of particular embodiments of the present disclosure address at least one aspect, problem, limitation, and/or disadvantage associated with existing routing methods and systems. While features, aspects, and/or advantages associated with certain embodiments have been described in the disclosure, other embodiments may also exhibit such features, aspects, and/or advantages, and not all embodiments need necessarily exhibit such features, aspects, and/or advantages to fall within the scope of the disclosure. It will be appreciated by a visitor of ordinary skill in the art that several of the above-disclosed structures, components, or alternatives thereof, can be desirably combined into alternative structures, components, and/or applications. In addition, various modifications, alterations, and/or improvements may be made to various embodiments that are disclosed by a person of ordinary skill in the art within the scope of the present disclosure, which is limited only by the following claims.

Claims

1. Dynamic routing method comprising:

5 retrieving a first reference travel route of a first vehicle, the first reference travel route comprising a first plurality of reference geo-locations;

receiving travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger;

10 determining compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the candidate passenger identifier is incorporated with the first reference travel route; and

one of accepting and reassigning the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.

- 15 2. The dynamic routing method as in Claim 1, accepting the candidate passenger based on outcome of the compliance with the first operating requirements being determined comprising:

updating the first reference travel route with the travel details of the candidate passenger identifier.

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3. The dynamic routing method as in Claim 1, determining compliance with first operating requirements associated with the first vehicle comprising:

assessing suitability of the size of the first vehicle based the travel details of the candidate passenger identifier; and

25 one of accepting and reassigning the candidate passenger further based on the suitability of the size of the first vehicle according to travel details of the candidate passenger identifier.

4. The dynamic routing method as in Claim 1, further comprising:

tracking actual geo-location of the first vehicle during travel thereof to generate an actual travel route, the actual travel route of the first vehicle being one of generated progressively during travel thereof and generated after completion of travel of the first vehicle to all the first plurality of reference geo-locations.

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5. The dynamic routing method as in Claim 4, further comprising:
 - recording time of the first vehicle at at least one of the first plurality of reference geo-locations; and
 - recording speed of first vehicle at various points along the actual travel route.

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6. The dynamic routing method as in Claim 4, further comprising:
 - identifying deviation of actual travel route from the first reference travel route and calculating delay duration contributed by the deviation; and
 - generating an alert comprising the delay duration.

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7. The dynamic routing method as in Claim 4, further comprising:
 - calculating estimated arrival time for each of the first plurality of reference geo-locations;
 - comparing actual arrival time of the first vehicle to the estimated arrival time at each of the first plurality of reference geo-locations; and
 - generating an alert comprising an estimated delay duration in response to the difference between the estimated arrival time and the actual arrival time is beyond a pre-defined delay limit.

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- 25 8. The dynamic routing method as in Claim 1, further comprising:
 - initiating a check-list on a user-interface (UI) of a computing device for a driver of the first vehicle once navigation for the first reference travel route is requested,
 - wherein acknowledgement of the check-list on the computing device by the driver is required prior to initiating navigation for the first reference travel route.

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9. The dynamic routing method as in Claim 1, determining compliance with first operating requirements associated with the first vehicle comprising:

retrieving a first passenger list, the first passenger list being descriptive of a first plurality of passenger identifiers with at least two of the first plurality of reference geo-locations being associated with each of the first plurality of passenger identifiers, each of the first plurality of passenger identifiers being indicative of a passenger being assigned to the first vehicle;

generating a first temporary travel route from a first plurality of temporary geo-locations comprising the first plurality of reference geo-locations and at least one candidate geo-location, the travel details of the candidate passenger identifier comprising the at least one candidate geo-location;

determining compliance of at least one of total duration of the first temporary travel route and total number of passengers of the first vehicle between each adjacent pair of the first plurality of temporary geo-locations along the temporary travel route with first operating requirements associated with the first vehicle.

10. The dynamic routing method as in Claim 1, further comprising:

generating a trip task for the first reference travel route, the trip task comprising at least one of the first plurality of reference geo-locations and profile details of the first plurality of passenger identifiers.

11. The dynamic routing method as in Claim 9, accepting the candidate passenger identifier based on outcome of the compliance with the first operating requirements being determined comprising:

updating the first plurality of reference geo-locations with the first plurality of temporary geo-locations and the first reference travel route with the first temporary travel route; and

adding the candidate passenger identifier to the first passenger list in response to compliance with the first operating requirements,

wherein the candidate passenger is accepted in response to compliance with the first operating requirements being determined.

12. The dynamic routing method as in Claim 9, reassigning the candidate passenger based on outcome of the compliance with the first operating requirements being determined comprising:

generating a second temporary travel route from a second plurality of temporary geo-locations comprising a second plurality of reference geo-locations and the at least one candidate geo-location, the second plurality of reference geo-locations constituting a second reference travel route associated with a second vehicle;

assessing compliance of at least one of total duration of the temporary travel route and total number of passengers of the second vehicle between each adjacent pair of the plurality of temporary geo-locations along the temporary travel route with second operating requirements associated with the second vehicle;

updating the second plurality of reference geo-locations with the second plurality of temporary geo-locations and the second reference travel route with the second temporary travel route in response to compliance with the second operating requirements; and

adding the candidate passenger identifier to a second passenger list in response to compliance with the operating requirements being determined, the second passenger list being descriptive of a second plurality of passenger identifiers with at least two of the second plurality of reference geo-locations being associated with each of the second plurality of passenger identifiers, each of the second plurality of passenger identifiers being indicative of a passenger being assigned to the second vehicle.

13. The dynamic routing method as in Claim 9, reassigning the candidate passenger identifier based on outcome of the compliance with the first operating requirements being determined comprising:

generating an alert for non-compliance with the first operating requirements,

wherein the alert is communicable to at least one computing device for display on user-interface (UI) thereof.

14. Dynamic routing system comprising:

5 a data storage module;

a data staging module for retrieving a first reference travel route of a first vehicle, the first reference travel route comprising a first plurality of reference geo-locations from the data storage module, and for receiving travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger; and

10 a processing module for determining compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the candidate passenger identifier is incorporated with the first reference travel route, and for one of accepting and reassigning the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.

15. The dynamic routing system as in Claim 14, the processing module further for:

20 assessing suitability of the size of the first vehicle based the travel details of the candidate passenger identifier; and

one of accepting and reassigning the candidate passenger further based on the suitability of the size of the first vehicle according to travel details of the candidate passenger identifier.

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16. The dynamic routing system as in Claim 14, the processing module further for:

tracking actual geo-location of the first vehicle during travel thereof to generate an actual travel route, the actual travel route of the first vehicle being one of generated progressively during travel thereof and generated after completion of travel of the first vehicle to all the first plurality of reference geo-locations;

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recording time of the first vehicle at at least one of the first plurality of reference geo-locations; and

recording speed of first vehicle at various points along the actual travel route.

5 17. The dynamic routing system as in Claim 16, the processing module further for:
 identifying deviation of actual travel route from the first reference travel
 route and calculating delay duration contributed by the deviation; and
 generating an alert comprising the delay duration.

10 18. The dynamic routing system as in Claim 16, the processing module further for:
 calculating estimated arrival time for each of the first plurality of reference
 geo-locations;
 comparing actual arrival time of the first vehicle to the estimated arrival time
 at each of the first plurality of reference geo-locations; and
15 generating an alert comprising an estimated delay duration in response to the
 difference between the estimated arrival time and the actual arrival time is beyond a
 pre-defined delay limit.

19. The dynamic routing system as in Claim 14, the processing module determines
20 compliance with first operating requirements associated with the first vehicle by:
 retrieving a first passenger list, the first passenger list being descriptive of a
 first plurality of passenger identifiers with at least two of the first plurality of reference
 geo-locations being associated with each of the first plurality of passenger identifiers,
 each of the first plurality of passenger identifiers being indicative of a passenger being
25 assigned to the first vehicle;
 generating a first temporary travel route from a first plurality of temporary
 geo-locations comprising the first plurality of reference geo-locations and at least one
 candidate geo-location, the travel details of the candidate passenger identifier
 comprising the at least one candidate geo-location;

determining compliance of at least one of total duration of the temporary travel route and total number of passengers of the first vehicle between each adjacent pair of the plurality of temporary geo-locations along the temporary travel route with first operating requirements associated with the first vehicle,

5 wherein the processing module accepts the candidate passenger based on outcome of the compliance with the first operating requirements being determined by:

 updating the first plurality of reference geo-locations with the first plurality of temporary geo-locations and the first reference travel route with the first temporary travel route; and

10 adding the candidate passenger identifier to the first passenger list in response to compliance with the operating requirements,

 wherein the candidate passenger is accepted in response to compliance with the first operating requirements being determined.

15 20. The dynamic routing system as in Claim 14, the processing module reassigns the candidate passenger based on outcome of the compliance with the first operating requirements being determined by:

 generating a second temporary travel route from a second plurality of temporary geo-locations comprising a second plurality of reference geo-locations and
20 the at least one candidate geo-location, the second plurality of reference geo-locations constituting a second reference travel route associated with a second vehicle;

 assessing compliance of at least one of total duration of the temporary travel route and total number of passengers of the second vehicle between each adjacent pair of the plurality of temporary geo-locations along the temporary travel route with
25 second operating requirements associated with the second vehicle;

 updating the second plurality of reference geo-locations with the second plurality of temporary geo-locations and the second reference travel route with the second temporary travel route in response to compliance with the second operating requirements; and

adding the candidate passenger identifier to a second passenger list in response to compliance with the operating requirements being determined, the second passenger list being descriptive of a second plurality of passenger identifiers with at least two of the second plurality of reference geo-locations being associated with each of the second plurality of passenger identifiers, each of the second plurality of passenger identifiers being indicative of a passenger being assigned to the second vehicle.

21. A machine-readable medium having stored therein a plurality of programming instructions, which when executed, the instructions cause the machine to:

retrieve a first reference travel route of a first vehicle, the first reference travel route comprising a first plurality of reference geo-locations;

receive travel details of a candidate passenger identifier, the candidate passenger identifier being indicative of a candidate passenger;

determine compliance of at least one of total duration of the reference travel route and total number of passengers of the first vehicle with first operating requirements associated with the first vehicle when the travel details of the candidate passenger identifier is incorporated with the first reference travel route; and

one of accept and reassign the candidate passenger identifier based on outcome of compliance with the first operating requirements being determined.