Description

Title of Invention: METHOD AND APPARATUS FOR OPTIMIZING EFFICIENCY OF A TRANSPORT PROVIDER

Technical Field

[0001] The present invention relates broadly, but not exclusively, to methods for optimizing efficiency of a transport provider.

Background Art

[0002] With the rapid development of urban transport, road network structure is becoming more complex, increasing delivery traffic. There are many factors affecting the proper and efficient operation of an urban transit system. Some of these factors include infrastructure, the advanced nature of operations management and the corresponding technical means.

[0003] Urbanization poses many challenges for providing transportation services in urban area. This includes optimizing efficiency of a transport provider. One such example is the increased difficulty in improving capacity and improving service quality of bus service operators.

[0004] There are two possible ways to manage operations of a transport provider, namely, on time adherence against a predefined schedule and managing headway equality between trips. In that regard, schedule optimization technology is a technology that has been applied in the management of urban transit operation. Schedule optimization can be based on real-time traffic information, the initial schedule, and speed data of the vehicles to optimize the efficiency. Parameters that the transport providers are working on to improve are a headway which is a measurement of the distance or time between vehicles in a transit system. The minimum headway is the shortest distance or time achievable by a system without a reduction in the speed of vehicles. Around the world, transport providers aim to optimize efficiency by working towards headway equality between trips.

Summary

[0005] Currently, conventional techniques improves headway by adopting estimated time arrival (ETA) which focuses on the arrival time of the vehicle at the next location (or station). One problem with this technique is that there are not many options to adjust a plan if it already includes subsequent trips and the transport provider may not have the capacity to avoid potential delays.

[0006] In one conventional technique, departure and arrival times for ongoing vehicles and subsequent trips are adjusted in an iterative manner, based on the departure and

[0011] In a first aspect, the present disclosure provides a method for optimizing efficiency of a transport provider, comprising: receiving, by a processor, a first departure time of a vehicle, which is administered by the transport provider, at a first location; receiving, by the processor, a second departure time of the vehicle at a second location which is located after the first location; determining , by the processor, a difference between the first departure time and the second departure time; and updating, by the processer, a current schedule to provide an updated schedule in response to the determination of the difference, the updated schedule indicating an updated estimated arrival time of the vehicle at a location after the second location.

[0012] In one embodiment, the step of updating the current schedule to provide the updated schedule comprises: updating, by the processor, an estimated first departure time of at least one other vehicle, to provide an updated estimated first departure time, the at least one other vehicle being one which is administered by the transport provider and the estimated first departure time of at least one other vehicle being one at which the at least one other vehicle is expected to depart from the first location. In one embodiment, the method further comprises receiving, by the processor, a first departure time of the at least one other vehicle, the first departure time of the at least one other vehicle being one at which the at least one other vehicle departs from the first location.

[0013] In one embodiment, the method further comprises determining, by the processor, a difference between the updated estimated first departure time of the at least one other vehicle and the recorded first departure time of the at least one other vehicle, the difference being a control measure data.

[0014] In one embodiment, the current schedule is updated to provide the updated schedule in response to the determination of the control measure data.

[0015] In one embodiment, the method further comprises optimizing, by the processor, a headway between the vehicle and the at least one other vehicle in response to the updated schedule.

[0016] In one embodiment, the step of optimizing the headway comprises receiving, by the processor, predetermined data relevant to at least the vehicle; and optimizing, by the processor, the headway in response to the step of receiving of the predetermined data.

[0017] In one embodiment, the at least one other vehicle is one that is in transit.

[0018] In one embodiment, wherein the step of updating the current schedule to provide the updated schedule comprises receiving, by the processor, speed information relating to the vehicle, wherein the current schedule is updated to provide the updated schedule in response to the step of receiving the speed information relating to the vehicle.

[0019] In one embodiment, the method further comprises displaying, on a display, the updated schedule.

[0019a] In a second aspect, the present disclosure provides an apparatus for optimizing efficiency of a transport provider, the apparatus comprising: means for receiving a first departure time of a vehicle which is administered by the transport provider at a first location; means for receiving a second departure time of the vehicle at a second location which is located after the first location; means for determining a difference between the first departure time and the second departure time; and means for updating a current schedule to provide an update schedule in response to the determination of the difference, the updated schedule indicating an updated estimated arrival time of the vehicle at a location after the second location.

[0020] In another embodiment, an apparatus for optimizing efficiency of a transport provider is provided, the apparatus comprising at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with at least one processor, cause the apparatus at least to: receive a first departure time of a vehicle which is administered by the transport provider at a first location;

receive a second departure time of the vehicle at a second location which is located after the first location; determine a difference between the first departure time and the second departure time; and update a current schedule to provide an updated schedule in response to the determination of the difference, the updated schedule indicating an updated estimated arrival time of the vehicle at a location after the second location.

[0021] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to: receive a first departure time of the at least one other vehicle, the first departure time of the at least one other vehicle being one at which the at least one other vehicle departs from the first location.

[0022] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to: determine a difference between the updated estimated first departure time of the at least one other vehicle and the recorded first departure time of the at least one other vehicle, the difference being a control measure data.

[0023] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to update the current schedule to provide the updated schedule in response to the determination of the control measure data.

[0024] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to optimize a headway between the vehicle and the at least one other vehicle in response to the updated schedule.

[0025] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to receive predetermined data relevant to at least the vehicle; and optimize the headway in response to the receipt of the predetermined data.

[0026] In one embodiment, the at least one memory and the computer program code is further configured with the at least one processor to receive speed information relating to the vehicle, wherein the current schedule is updated to provide the updated schedule in response to the receipt of the speed information relating to the vehicle.

[0027] In one embodiment, wherein the at least one memory and the computer program