[CLAIMS]

[Claim 1]

A service management device comprising:

a valid cars determining unit configured to determine the number of valid cars of each train such that a passenger transport volume per unit time of a plurality of trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time; and

a control information generating unit is configured to generate control information for performing control which causes trains having valid cars corresponding to the number of valid cars determined by the valid cars determining unit to operate at a predetermined interval.

[Claim 2]

The service management device according to claim 1, further comprising an operational cars determining unit configured to determine the number of operational cars per unit time on the basis of the necessary transport volume,

wherein the valid cars determining unit is configured to determine the number of valid cars of each train on the basis of the number of operational cars which is determined by the operational cars determining unit.

[Claim 3]

The service management device according to claim 2, wherein the operational cars determining unit configured to determine the number of operational cars to be a predetermined minimum value or more.

[Claim 4]

The service management device according to any one of claims 1 to 3, further

comprising a necessary transport volume specifying unit configured to specify the necessary transport volume on the basis of data associated with a previous operation.

[Claim 5]

The service management device according to any one of claims 1 to 4, further comprising:

an index value specifying unit configured to specify an index value which increases as energy consumption increases when the trains run and which increases as a changing frequency of the number of valid cars increases on the basis of the number of valid cars determined by the valid cars determining unit;

a time zone changing unit configured to change a length of a time zone; and

an operating plan determining unit configured to determine the number of valid cars of each train to be the number of valid cars in which the index value is smallest,

wherein the valid cars determining unit is configured to determine the number of valid cars of each train operating for each predetermined time zone, and

the control information generating unit is configured to generate control information for performing control which causes the trains having the valid cars corresponding to the number of valid cars determined by the operating plan determining unit to operate at the predetermined interval.

[Claim 6]

The service management device according to any one of claims 1 to 5, wherein the valid cars determining unit is configured to determine the number of valid cars of each train from a predetermined valid car pattern.

[Claim 7]

A train control method comprising the steps of:

determining the number of valid cars of each train such that a passenger

transport volume per unit time of a plurality of trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time; and

causing trains having valid cars corresponding to the determined number of valid cars to operate at a predetermined interval.

[Claim 8]

The train control method according to claim 7, further comprising a step of stopping an auxiliary device of a car other than the valid cars in the train having more than the determined number of valid cars.

[Claim 9]

A program causing a computer to serve as:

a valid cars determining unit configured to determine the number of valid cars of each train such that a passenger transport volume per unit time of a plurality of trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time; and

a control information generating unit configured to generate control information for performing control which causes trains having valid cars corresponding to the number of valid cars determined by the valid cars determining unit to operate at a predetermined interval.

CLAIMS

[Claim 1]

A service management device comprising:

a valid cars determining unit configured to determine the number of valid cars of each train operating for each predetermined time zone such that a passenger transport volume per unit time of the trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time;

an index value specifying unit configured to specify an index value on the basis of the number of valid cars determined by the valid cars determining unit, the index value becoming larger as a changing frequency of the number of valid cars increases or becoming larger as an occupancy of the valid cars and a waiting time of passengers increase;

a time zone changing unit configured to change a length of a time zone which serves as a reference in a calculation of the number of valid cars by the valid cars determining unit;

an operating plan determining unit configured to determine the number of valid cars of each train to the number of valid cars having the smallest index value; and

a control information generating unit configured to generate control information for performing control which causes trains having valid cars corresponding to the number of valid cars determined by the operating plan determining unit to operate at a predetermined interval.

[Claim 2]

The service management device according to claim 1, further comprising an operational cars determining unit configured to determine the number of operational cars per unit time on the basis of the necessary transport volume,

wherein the valid cars determining unit is configured to determine the number of valid cars of each train on the basis of the number of operational cars which is determined by the operational cars determining unit.

[Claim 3]

The service management device according to claim 2, wherein the operational cars determining unit is configured to determine the number of operational cars to be a predetermined minimum value or more.

[Claim 4]

The service management device according to any one of claims 1 to 3, further comprising a necessary transport volume specifying unit configured to specify the necessary transport volume on the basis of data associated with a previous operation.

[Claim 5]

The service management device according to any one of claims 1 to 4, wherein the index value specifying unit is configured to specify an index value which increases as energy consumption increases when the trains run and which increases as the changing frequency of the number of valid cars increases on the basis of the number of valid cars determined by the valid cars determining unit.

[Claim 6]

The service management device according to any one of claims 1 to 5, wherein the valid cars determining unit is configured to determine the number of valid cars of each train from a predetermined valid car pattern.

[Claim 7]

A train control method comprising the steps of:

determining the number of valid cars of each train operating for each predetermined time zone such that a passenger transport volume per unit time of the trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time;

specifying an index value on the basis of the determined number of valid cars;

changing a length of the time zone which serves as a reference in calculating the number of valid cars, the index value becoming larger as a changing frequency of the number of valid cars increases or becoming larger as an occupancy of the valid cars and a waiting time of passengers increase;

determining the number of valid cars of each train to the number of valid cars having the smallest index value; and

generating control information for performing control which causes trains having valid cars corresponding to the determined number of valid cars to operate at a predetermined interval.

[Claim 8]

The train control method according to claim 7, further comprising a step of stopping an auxiliary device of a car other than the valid cars in the train having more than the determined number of valid cars.

[Claim 9]

A program causing a computer to serve as:

a valid cars determining unit configured to determine the number of valid cars of each train operating for each predetermined time zone such that a passenger transport volume per unit time of the trains is not less than a necessary transport volume and the total number of valid cars is minimized when a plurality of trains having one or more cars run with a predetermined number of operational cars per unit time;

an index value specifying unit configured to specify an index value on the basis of the number of valid cars determined by the valid cars determining unit, the index value becoming larger as a changing frequency of the number of valid cars increases or becoming larger as an occupancy of the valid cars and a waiting time of passengers increase;

a time zone changing unit configured to change a length of the time zone which serves as a reference in a calculation of the number of valid cars by the valid cars determining unit;

an operating plan determining unit configured to determine the number of valid cars of each train to the number of valid cars having the smallest index value; and

a control information generating unit configured to generate control information for performing control which causes the trains having valid cars corresponding to the number of valid cars determined by the operating plan determining unit to operate at a predetermined interval.