CLAIMS

[Claim 1]

A travel control device that is mounted on a vehicle and sets a travel speed according to a position of the vehicle and causes the vehicle to travel, the device comprising:

a limit information acquisition unit that is configured to acquire limit information which indicates a plurality of relative positions to the front position with a current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions, from the vehicle speed limit unit that is configured to set the speed limits at a plurality of positions in order to achieve a predetermined deceleration completion speed at the speed limit start position;

a current position acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current position of the vehicle from a ground automatic train protection (ATP) device installed on a ground;

a current speed acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current speed of the vehicle from the ground ATP device;

a travel curve generation unit that is configured to generate a travel curve by taking a margin of a recognition position error of the vehicle speed limit unit with respect to each of the relative positions according to the limit information, the current position, and the current speed, and by associating a target speed not exceeding the speed limit with each of the positions including the margin; and

a speed command unit that is configured to generate a speed command according to the travel curve generated by the travel curve generation unit and the current position.

[Claim 2]

The travel control device according to Claim 1,

wherein the limit information acquisition unit is configured to acquire the limit information which includes a plurality of relative positions up to the front position with the current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions as a sequence, and

wherein the travel curve generation unit is configured to generate the travel curve according to the limit information.

[Claim 3]

The travel control device according to Claim 1 or Claim 2,

wherein the limit information acquisition unit is configured to acquire limit information including only the sequence with respect to the representative speed among the sequence of the relative positions from the current position to the front position, and

wherein the travel curve generation unit is configured to generate the travel curve according to the limit information.

[Claim 4]

The travel control device according to Claim 1 or Claim 2,

wherein the limit information acquisition unit is configured to acquire the limit information including the relative position from the current position to a deceleration completion position, the speed, and a guaranteed deceleration, and

wherein the travel curve generation unit is configured to generate the travel curve according to the limit information.

[Claim 5]

A vehicle comprising:

a vehicle speed limit unit that is configured to set a speed limit at each position in order to achieve a predetermined deceleration completion speed at the speed limit start position;

a limit information acquisition unit that is configured to acquire limit information which indicates a plurality of relative positions to the front position with a current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions, from the vehicle speed limit unit;

a current position acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current position of the vehicle from a ground automatic train protection (ATP) device installed on a ground;

a current speed acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current speed of the vehicle from the ground ATP device;

a travel curve generation unit that is configured to generate a travel curve by taking a margin of a recognition position error of the vehicle speed limit unit with respect to each of the relative positions according to the limit information, the current position, and the current speed, and by associating a target speed not exceeding the speed limit with each of the positions including the margin; and

a speed command unit that is configured to generate a speed command according to the travel curve generated by the travel curve generation unit and the current position.

[Claim 6]

A traffic system comprising:

a vehicle that includes:

a vehicle limit unit that is configured to set speed limits at each position in order to achieve a predetermined deceleration completion speed at the speed limit start position;

a limit information acquisition unit that is configured to acquire limit information which indicates a plurality of relative positions to the front position with a current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions, from the vehicle speed limit unit;

a current position acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current position of the vehicle from a ground automatic train protection (ATP) device installed on a ground;

a current position acquisition unit that is configured to acquire indirectly through the vehicle speed limit unit, a current position of the vehicle from the ground ATP device;

a travel curve generation unit that is configured to generate a travel curve

by taking a margin of a recognition position error of the vehicle speed limit unit with respect to each of the relative positions according to the limit information, the current position, and the current speed, and by associating a target speed not exceeding the speed limit with each of the positions including the margin; and

a speed command unit that is configured to generate a speed command according to the travel curve generated by the travel curve generation unit and the current position.

[Claim 7]

A control method of a travel control device that is mounted on a vehicle and sets a travel speed according to a position of the vehicle and causes the vehicle to travel, the method comprising:

causing a limit information acquisition unit of the travel control device to acquire limit information which indicates a plurality of relative positions to the front position with a current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions, from the vehicle speed limit unit of the travel control device that sets the speed limits at a plurality of positions in order to achieve a predetermined deceleration completion speed at the speed limit start position;

causing a current position acquisition unit of the travel control device to acquire indirectly through the vehicle speed limit unit, a current position of the vehicle from a ground automatic train protection (ATP) device installed on a ground;

causing a current speed acquisition unit of the travel control device to acquire indirectly through the vehicle speed limit unit, a current speed of the vehicle from the ground ATP device;

causing a travel curve generation unit of the travel control device to generate a travel curve by taking a margin of a recognition position error of the vehicle speed limit unit with respect to each of the relative positions according to the limit information, the current position, and the current speed, and by associating a target speed not exceeding the speed limit with each of the positions including the margin; and

causing a speed command unit of the travel control device to generate a speed command according to the travel curve generated by the travel curve generation unit and the current position.

[Claim 8]

A program causing a computer in a travel control device, which is mounted on a vehicle and sets a travel speed according to a position of the vehicle and causes the vehicle to travel, to function as:

limit information acquisition means for acquiring limit information which indicates a plurality of relative positions to the front position with a current position as a reference and each speed limit information at the front position indicated by each of the plurality of relative positions, from the vehicle speed limit unit of the travel control device that sets the speed limits at a plurality of positions in order to achieve a predetermined deceleration completion speed at the speed limit start position;

current position acquisition means for acquiring indirectly through the vehicle speed limit unit, a current position of the vehicle from a ground automatic train protection (ATP) device installed on a ground;

current speed acquisition means for acquiring indirectly through the vehicle speed limit unit, a current speed of the vehicle from the ground ATP device;

travel curve generation means for generating a travel curve by taking a margin of a recognition position error of the vehicle speed limit unit with respect to each of the relative positions according to the limit information, the current position, and the current speed, and by associating a target speed not exceeding the speed limit with each of the positions including the margin; and

speed command means for generating a speed command according to the travel curve generated by the travel curve generation unit and the current position.