CLAIMS

[Claim 1]

A moving body monitoring system that monitors a moving body traveling on a traveling path, comprising:

a laser radar configured to irradiate a predetermined region set on the traveling path with a laser, and to detect a reflected signal of the laser by an object in the predetermined region at a predetermined cycle;

a moving body detecting unit configured to detect a moving body existing in the predetermined region and a shape of the moving body, based on the reflected signal detected by the laser radar;

a moving direction detecting unit configured

a) to set a plurality of divided regions in the predetermined region,

b) to determine whether the moving bodies detected by the moving body detecting unit at different timings of the predetermined cycle are the same based on the shape of each moving body, and

c) to detect a moving direction of the moving bodies that are determined to be the same based on a presence or absence of the moving bodies that are determined to be the same in each of the divided regions; and

a traffic flow calculating unit configured to calculate a traffic flow data including a number of the moving bodies in each travel path through the predetermined region or a traffic density in each of the divided regions detected by the moving body detecting unit and the moving direction of each moving body detected by the moving direction detecting unit.

[Claim 2]

The moving body monitoring system according to claim 1, wherein

the moving body detecting unit detects a size of the moving body based on the reflected signal, and

the moving direction detecting unit

determines whether the moving bodies that are detected at different timings are the same based on the size of each moving body.

[Claim 3]

The moving body monitoring system according to claim 2, wherein

the moving body detecting unit

determines a type of the moving body based on at least one of the size and the shape of the moving body.

[Claim 4]

The moving body monitoring system according to any one of claims 1 to 3, wherein

the moving direction detecting unit detects a speed of each moving body based on a position of each moving body detected by the moving body detecting unit at different timings of the predetermined cycle, and

the traffic flow data includes the speed of each moving body.

[Claim 5]

The moving body monitoring system according to any one of claims 1 to 4, wherein

the traffic flow calculating unit

detects a number of the moving body existing in each of the divided regions within a predetermined time by using the moving body detecting unit, and

creates a density map showing a density of the moving body existing in each of the divided regions within the predetermined time.

[Claim 6]

The moving body monitoring system according to any one of claims 1 to 5, wherein

the traveling path is an intersection having a traffic signal, and

the moving body monitoring system is provided with a communication unit configured

to calculate a lighting time of the traffic signal based on the traffic flow data calculated by the traffic flow calculating unit and

to transmit a traffic signal lighting data indicating the calculated lighting time.

[Claim 7]

A control server of a moving body monitoring system that monitors a moving body traveling on a traveling path, comprising:

a moving body detecting unit configured to detect a moving body existing in a predetermined region and a shape of the moving body, based on a reflected signal detected by a laser radar which irradiates the predetermined region set on the traveling path with a laser and detects the reflected signal of the laser by an object in the predetermined region at a predetermined cycle;

a moving direction detecting unit configured

a) to set a plurality of divided regions in the predetermined region,

b) to determine whether the moving bodies detected by the moving body detecting unit at different timings of the predetermined cycle are the same based on the shape of each moving body, and

c) to detect a moving direction of the moving bodies that are determined to be the same based on a presence or absence of the moving bodies that are determined to be the same in each of the divided regions; and

a traffic flow calculating unit configured to calculate a traffic flow data including a number of the moving bodies in each travel path through the predetermined region or a traffic density in each of the divided regions detected by the moving body detecting unit and the moving direction of each moving body detected by the moving direction detecting unit.

[Claim 8]

A moving body monitoring method that monitors a moving body traveling on a traveling path, comprising:

a step of irradiating a predetermined region set on the traveling path with a laser, and detecting a reflected signal of the laser by an object in the predetermined region at a predetermined cycle;

a step of detecting a moving body existing in the predetermined region and a shape of the moving body, based on the reflected signal;

a step of setting a plurality of divided regions in the predetermined region;

a step of determining whether the moving bodies detected by the moving body detecting unit at different timings of the predetermined cycle are the same based on the shape of each moving body;

a step of detecting a moving direction of the moving bodies that are determined to be the same based on a presence or absence of the moving bodies that are determined to be the same in each of the divided regions; and

a step of calculating a traffic flow data including a number of the moving

bodies in each travel path through the predetermined region or a traffic density in each of the divided regions and the moving direction of each moving body.