**Claims**

1. A method for safely operating a rail traffic system (1), having the steps:

1.1. Collecting first rail traffic information (31) correlating with a state variable of the rail traffic system (1),

1.2. Transmitting second rail traffic information (32, 42) correlating with the state variable of the rail traffic system (1) between a first rail vehicle (3) and an infrastructure facility (2) and/or a second rail vehicle (4),

1.3. Determining a comparison result on the basis of the first rail traffic information (31) and the second rail traffic information (32, 42),

1.4. Checking the plausibility of the first rail traffic information (31) and/or the second rail traffic information (32, 42) using the comparison result, and

1.5. Controlling the rail traffic system (1) using the result of the plausibility check,

1.6. wherein the first rail traffic information (31) and/or the second rail traffic information (32, 42) is based on a measuring value, which is detected by means of a line-shaped rail sensor (12b) of the infrastructure facility (2) for detecting a passing rail vehicle (3, 4), such as a light guide sensor, in particular a glass fibre sensor.

2. The method according to claim 1, **characterized in that** the first rail traffic information (31) is collected by means of the first rail vehicle (3), and that the second rail traffic information (32, 42) is based on the measuring value detected by means of the line-shaped rail sensor (12b).

3. The method according to claim 1, **characterized in that** the first rail traffic information (31) is collected by means of the infrastructure facility (2), and that the second rail traffic information (32, 42) is transmitted to the infrastructure facility (2).

4. The method according to claim 1 or 2, **characterized in that** the first rail traffic information (31) is detected by means of a GPS receiver (20) for detecting a position of a rail vehicle (3, 4) in a rail network (5) and that the second rail traffic information (32, 42) is based on the measuring value detected by means of the line-shaped rail sensor (12b).

5. The method according to one of the preceding claims, **characterized in that** checking the plausibility is done at regular time intervals.

6. The method according to one of the preceding claims, **characterized by** controlling the rail traffic system (1) by means of at least one piece of rail traffic information (31, 32) modified using the comparison result.

7. The method according to one of the preceding claims, **characterized by** calibrating the collection of the first rail traffic information (31) and/or the second rail traffic information (32, 42) using the comparison result.

8. The method according to one of the preceding claims, **characterized by** controlling rail vehicles (3, 4) of different control capacity classes in the same rail traffic system (1) in different manners.

9. The method according to one of the preceding claims, **characterized by** classifying the at least one rail vehicle (3, 4) in a higher control capacity class due to controlling the rail traffic system (1) using the result of the plausibility check.

10. The method according to one of the preceding claims, **characterized by** classifying the at least one rail vehicle (3, 4) in a higher control capacity class due to continuous transmission of the second rail traffic information (31, 32).

11. The method according to one of the preceding claims, **characterized by** classifying the at least one rail vehicle (3, 4) depending on the result of the plausibility check.

12. The method according to one of the preceding claims, **characterized by** transferring at least one rail vehicle (3, 4) on the basis of its control capacity class to a highly utilized rail line section (6, 7, 8) to increase the traffic capacity.

13. The method according to one of the preceding claims, **characterized in that** controlling the rail traffic system (1) using the result of the plausibility check comprises the determination of travel parameter ranges to be complied with and/or rail line sections (6, 7, 8) that can be travelled on.

14. The method according to one of the preceding claims, **characterized in that** controlling the rail traffic system (1) is based at least in part on travelling in moving spatial distances.

15. The method according to one of the preceding claims, **characterized by** controlling the infrastructure facility (2) due to a control command of the at least one rail vehicle (3, 4).

16. A rail traffic system (1), having
    16.1. an infrastructure facility (2) and/or
    16.2. at least one rail vehicle (3, 4),
    16.3. with the infrastructure facility (2) and/or the at least one rail vehicle (3, 4) having at least one control unit (22, 24) for carrying out a method according to one of the claims 1 to 15.