CLAIMS

1. A vehicular system comprising:

lateral shift amount measurement means each to measure a lateral shift amount, that is a positional deviation of a vehicle in a vehicle width direction with respect to a magnetic marker; and

a course estimation means that uses a difference between lateral shift amounts with respect to two magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels and estimates a deviation of the vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers, wherein

the lateral shift amount measurement means are arranged at at least two positions separated in a longitudinal direction of the vehicle with a space equal to the space between the two magnetic markers, and

the course estimation means estimates said deviation in the traveling direction by using a difference between a lateral shift amount measured by a front-side lateral shift amount measurement means of two of the lateral shift amount measurement means separated with the space equal to the space between the two magnetic markers with one magnetic marker positioned on a vehicle forwarding side of the two magnetic markers and a lateral shift amount measured by a rear-side lateral shift amount measurement means with another magnetic marker.

2. A vehicular system comprising:

a lateral shift amount measurement means that measures a lateral shift amount, that is a positional deviation of a vehicle in a vehicle width direction with respect to a magnetic

marker; and

a course estimation means that uses a difference between lateral shift amounts with respect to two magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels and estimates a deviation of the vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers, wherein

the course estimation means changes the space between the two magnetic markers for use in estimation of said deviation in accordance with a vehicle velocity.

3. The vehicular system according to claim 1 or 2, wherein the system acquires information that can identify a deviation in the line segment direction with respect to a route direction of a traveling road where the vehicle travels, and estimates a deviation of the vehicle in the traveling direction with respect to the route direction of the traveling road based on the deviation in the line segment direction with respect to the route direction identified by using this information and said deviation in the traveling direction of the vehicle with respect to the line segment direction.

4. A vehicular system comprising:

a lateral shift amount measurement means that measures a lateral shift amount, that is a positional deviation of a vehicle in a vehicle width direction with respect to a magnetic marker; and

a course estimation means that uses a difference between lateral shift amounts with respect to two magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels and estimates a deviation of the

vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers, wherein

the system acquires information that can identify a deviation in the line segment direction with respect to a route direction of a traveling road where the vehicle travels, and estimates a deviation of the vehicle in the traveling direction with respect to the route direction of the traveling road based on the deviation in the line segment direction with respect to the route direction identified by using this information and said deviation in the traveling direction of the vehicle with respect to the line segment direction.

5. The vehicular system according to any one of claims 1 to 4, wherein the two magnetic markers are disposed along a route direction of a traveling road where the vehicle travels.

6. The vehicular system according to any one of claims 1 to 5, wherein

the magnetic markers are disposed along a lane that is a region of the vehicle to travel, and

the system further comprises a prediction means that predicts at least one of a time and a distance until the vehicle departs from the lane by using the lateral shift amount, said deviation, and a vehicle velocity, and a warning means which issues warning in accordance with the time or the distance predicted by the prediction means.

7. The vehicular system according to any one of claims 1 to 6, wherein

the magnetic markers are disposed along a lane that is a region of the vehicle to travel, and

the system further comprises a means that estimates a three-dimensional road structure with reference to an own vehicle by using the lateral shift amount and said deviation.

8. The vehicular system according to any one of claims 1 to 7, wherein the system identifies an absolute position of the vehicle at a time point when said deviation in the traveling direction of the vehicle is estimated by acquiring an absolute position of the magnetic marker.

9. A course estimation method of a vehicle comprising lateral shift amount measurement means each to measure a lateral shift amount, that is a positional deviation of the vehicle in a vehicle width direction with respect to each of magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels, wherein

in the vehicle, two of the lateral shift amount measurement means are arranged at positions separated in a longitudinal direction of the vehicle with a space equal to the space between two of the magnetic markers disposed in the road surface, and

the method comprises:

estimating a deviation of the vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers by using a difference between a lateral shift amount measured by a front-side lateral shift amount measurement means of the two of the lateral shift amount measurement means with one magnetic marker positioned on a vehicle forwarding side of the two magnetic markers and a lateral shift amount measured by a rear-side lateral shift amount measurement means with another magnetic marker.

10. A course estimation method of a vehicle comprising a lateral shift amount measurement means measuring a lateral shift amount, that is a positional deviation of the vehicle in a vehicle width direction with respect to each of magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels,

the method comprising:

a process for measuring the lateral shift amount with respect to each of two of the magnetic markers disposed with the space provided therebetween in the road surface where the vehicle travels; and

a process for estimating a deviation of the vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers by using a difference between lateral shift amounts with respect to the two magnetic markers, wherein

the space between the two magnetic markers for use in estimation of said deviation is changed in accordance with a vehicle velocity.

11. The course estimation method according to claim 9 or 10, the method further comprising:

acquiring information that can identify a deviation in the line segment direction with respect to a route direction of a traveling road where the vehicle travels; and

estimating a deviation of the vehicle in the traveling direction with respect to the route direction of the traveling road based on the deviation in the line segment direction with respect to the route direction identified by using this information and said deviation in the traveling direction of the vehicle with respect to the line segment direction.

12. A course estimation method of a vehicle comprising a lateral shift amount measurement means measuring a lateral shift amount, that is a positional deviation of the vehicle in a vehicle width direction with respect to each of magnetic markers disposed with a space provided therebetween in a road surface where the vehicle travels,

the method comprising:

a process for measuring the lateral shift amount with respect to each of two of the magnetic markers disposed with the space provided therebetween in the road surface where the vehicle travels; and

a process for estimating a deviation of the vehicle in a traveling direction with respect to a line segment direction connecting positions of the two magnetic markers by using a difference between lateral shift amounts with respect to the two magnetic markers, wherein

the method further comprises:

acquiring information that can identify a deviation in the line segment direction with respect to a route direction of a traveling road where the vehicle travels; and

estimating a deviation of the vehicle in the traveling direction with respect to the route direction of the traveling road based on the deviation in the line segment direction with respect to the route direction identified by using this information and said deviation in the traveling direction of the vehicle with respect to the line segment direction.

13. The course estimation method according to any one of claims 9 to 12, wherein the two magnetic markers are disposed along a route direction of a traveling road where the vehicle travels.