CLAIMS

1. A system comprising:

a ride seat disposed within an amusement park ride and having a support against which a rider can be restrained;

a restraint associated with the ride seat and configured to restrain the rider within the ride seat, wherein the restraint comprises a first portion having a first connector, a second portion having a second connector, a first retro-reflective marker disposed on the first connector and a second retro-reflective marker disposed on the second connector, wherein the first connector and the second connector are configured to couple to one another to secure the restraint and thereby restrain the rider within the ride seat; and

a tracking system configured to determine whether the restraint is secured based at least on identification and tracking of the first and second retro-reflective markers, wherein the tracking system comprises:

an emitter configured to emit light toward the first and second retro-reflective markers;

a detector configured to detect retro-reflected light from the first and second retro-reflective markers; and

a controller coupled to the detector and configured to identify respective positions of the first and second retro-reflective markers based on detection of the retro-reflected light, wherein the controller is configured to determine a status of the restraint indicative of whether the first and second connectors are coupled based on relative positioning of the first and second retro-reflective markers, and wherein the controller is configured to adjust an operational parameter of the amusement park ride based on the status of the restraint.

2. The system of claim 1, wherein the controller is further configured to determine the position of the first connector relative to the second connector based on a distance between the first retro-reflective marker and the second retro-reflective marker.

3. The system of claim 1, wherein the controller is further configured to determine whether the restraint is secured based on a change in distance between the first retro-reflective marker and the second retro-reflective marker, wherein the first connector is connected to the second connector when the restraint is secured.

4. The system of claim 3, wherein the controller is further configured to associate a decrease in the distance between the first retro-reflective marker and the second retro-reflective marker from a first distance to a predetermined distance with securement of the restraint.

5. The system of claim 3, wherein the controller is further configured to associate an increase in the distance between the first retro-reflective marker and the second retro-reflective marker with a configuration in which the restraint is not secured.

6. The system of claim 1, wherein the controller is further configured to monitor a distance between the first retro-reflective marker and the second retro-reflective marker during operation of the amusement park ride to monitor the position of the first connector relative to the second connector and thereby continuously evaluate proper restraint of the rider.

7. The system of claim 1, wherein the controller is further configured to actuate an audible or visual alert via an interface communicatively coupled to the controller based on a change in a distance between the first connector and the second connector during operation of the amusement park ride.

8. The system of claim 1, wherein the first retro-reflective marker reflects light at a first

wavelength and the second retro-reflective marker reflects light at a second wavelength that is different from the first wavelength.

9. The system of claim 1, wherein the restraint is a belt formed by the first portion and the second portion, wherein the first portion comprises a first end portion having the first connector and a second end portion having the second connector.

10. The system of claim 1, wherein the first retro-reflective marker comprises a first plurality of retro-reflective markers and the second retro-reflective marker comprises a second plurality of retro-reflective markers.

11. A method comprising:

emitting electromagnetic radiation from an emitter of a tracking system toward a plurality of retro-reflective markers disposed on a ride seat of an amusement park ride, wherein the ride seat comprises a restraint comprising a first connector and a second connector, wherein a first portion of the plurality of retro-reflective markers is disposed on the first connector and a second portion of the plurality of retro-reflective markers is disposed on the second connector, wherein the first connector and the second connector are configured to couple to one another to secure the restraint and thereby restrain a rider within the ride seat, and wherein the tracking system is configured to identify and track the plurality of retro-reflective markers;

retro-reflecting the electromagnetic radiation with the plurality of retro-reflective markers;

detecting the retro-reflected electromagnetic radiation with a detector of the tracking system;

identifying respective positions of the first and second portions of the plurality of retro-reflective markers based on detection of the retro-reflected electromagnetic radiation;

determining a status of the restraint indicative of whether the first and second connectors are coupled based on relative positioning of the first and second portions of the plurality of retro-reflective markers using a controller communicatively coupled to the tracking system;

providing, using the controller, a user-perceivable indication of whether the restraint is secured or not secured based on the relative positioning of the first and second portions of the plurality of retro-reflective markers; and

adjusting an operational parameter of the amusement park ride based on the status of the restraint.

12. The method of claim 11, further comprising determining, using the controller, the relative positioning of the first and second portions of the plurality of retro-reflective markers based on a distance between the first and second portions of the plurality of retro-reflective markers, and associating a decrease in the distance between the first portion of the plurality of retro-reflective markers and the second portion of the plurality of retro-reflective markers with securement of the restraint.

13. The method of claim 11, further comprising determining, using the controller, a position of the first and second connectors based on a distance between the first and second portions of the plurality of retro-reflective markers, and associating, using the controller, an increase in the distance between the first portion of the plurality of retro-reflective markers and the second portion of the plurality of retro-reflective markers with a configuration in which the restraint is not secured.

14. The method of claim 13, further comprising monitoring, using the controller, a change in the distance between the first portion of the plurality of retro-reflective markers and the second portion of the plurality of retro-reflective markers during operation of the amusement park ride to

monitor whether the first connector and the second connector are coupled and thereby evaluate proper restraint of the rider.

15. The method of claim 11, further comprising actuating a device in response to determining the position of the first connector relative to the second connector, wherein the device is communicatively coupled to the amusement park ride.

16. A system comprising:

~~16. A system comprising:~~

a ride system disposed within an amusement park ride, wherein the ride system comprises:

a ride seat having a support against which a rider can be restrained;

a restraint associated with the ride seat and having a secured and unsecured configuration, wherein the secured configuration is configured to prevent the rider from exiting the ride seat;

a first plurality of retro-reflective markers configured to reflect light at a first wavelength; and

a second plurality of retro-reflective markers configured to reflect light at a second wavelength different from the first wavelength;

a tracking system configured to determine whether the restraint is secured based at least on identification and tracking of the first and second plurality of retro-reflective markers, wherein the tracking system comprises:

an emitter configured to emit light toward the first and second plurality of the retro-reflective markers;

a detector configured to detect the reflected light from the first and second plurality of the retro-reflective markers; and

a controller coupled to the detector and configured to identify respective positions of the first and second plurality of retro-reflective markers based on detection of the reflected light, wherein the controller is configured to determine whether the restraint is in the secured or unsecured configuration based on relative positioning of the first and second plurality of retro-reflective markers, and wherein the controller is configured to adjust an operational parameter of the amusement park ride based on a status of the restraint.

17. The system of claim 16, wherein the restraint comprises a belt comprising a first portion having a first end portion and a first connector disposed on the first end portion and a second portion having a second end portion and a second connector disposed on the second end portion, and wherein the first plurality of retro-reflective markers are disposed on the first connector and the second plurality of retro-reflective markers are disposed on the second connector.

18. The system of claim 17, wherein the controller is further configured to determine a position of the first and second connectors based on a distance between the first and second pluralities of retro-reflective markers and associate a decrease to a predetermined distance between the first plurality of retro-reflective markers and the second plurality of retro-reflective markers with the securement of the restraint.

19. The system of claim 17, wherein the controller is further configured to determine a position of the first and second connectors based on a distance between the first and second portions of the plurality of retro-reflective markers and associate an increase in the distance between the first plurality of retro-reflective markers and the second plurality of retro-reflective markers with the unsecured configuration.

~~20. An amusement park attraction system comprising:~~

~~a tracking system configured to monitor ridership, rider movement, or ride readiness of a plurality of ride vehicles based at least on identification and tracking of one or more retro-reflective markers associated with the plurality of ride vehicles, wherein the tracking system comprises:~~

one or more emitters configured to emit light, wherein the one or more emitters are located relative to a ride path, upon which the plurality of ride vehicles are configured to travel, such that the one or more emitters are able to emit the light toward the one or more retro-reflective markers associated with the plurality of ride vehicles;

one or more detectors configured to detect retro-reflected light, wherein the one or more detectors are located relative to the ride path such that the one or more detectors are able to receive retro-reflected light from the one or more retro-reflective markers associated with the plurality of ride vehicles; and

a controller coupled to the one or more detectors and configured to determine the ridership, the rider movement, or the ride readiness of the plurality of ride vehicles based on identification of which of the retro-reflective markers of the one or more retro-reflective markers associated with the plurality of ride vehicles are retro-reflecting the light, and wherein the controller is configured to adjust an operational parameter of the plurality of ride vehicles based on the ridership, the rider movement, or the ride readiness as determined by the controller.

21. The amusement park attraction system of claim 20, comprising the plurality of ride vehicles, wherein each ride vehicle of the plurality of ride vehicles comprises a plurality of seats, and each seat of the plurality of seats comprises a corresponding retro-reflective marker.

22. The amusement park attraction system of claim 21, wherein each seat of the plurality of seats comprises an array of retro-reflective markers, and wherein the controller is configured to monitor retro-reflection by the array of retro-reflective markers to determine whether each seat is occupied, or to monitor a degree of movement of a respective rider within each seat.

23. The amusement park attraction system of claim 22, wherein the array of retro-reflective markers is arranged to retro-reflect light in a pattern, and wherein the controller

is configured to identify changes in the pattern to determine the degree of movement of the respective rider.

24. The amusement park attraction system of claim 20, wherein the one or more emitters and the one or more detectors are located above the plurality of ride vehicles.

25. The amusement park attraction system of claim 20, comprising a building housing the ride path, wherein the one or more emitters and the one or more detectors are located on a ceiling of the building.

26. The amusement park attraction system of claim 20, wherein the controller is configured to count a total number of riders on the plurality of ride vehicles by identifying which retro-reflective markers are occluded by riders.

27. The amusement park attraction system of claim 20, comprising a track as the ride path.

28. The amusement park attraction system of claim 20, comprising the plurality of ride vehicles, wherein each ride vehicle of the plurality of ride vehicles comprises a ride door configured to secure a rider in the ride vehicle, wherein the ride vehicle includes a respective retro-reflective marker at an interface between a ride wall and a door wall, and wherein the controller is configured to evaluate a status of the ride door by detecting a change in light retro-reflected from the respective retro-reflective marker.

29. The amusement park attraction system of claim 28, wherein the interface is located on the ride wall or on the door wall.

30. The amusement park attraction system of claim 28, comprising a loading station configured to allow riders to enter the plurality of ride vehicles, and wherein the controller

~~is configured to allow the plurality of ride vehicles to leave the loading station in response to determining that the status of all ride doors indicates they are closed.~~

~~31. The amusement park attraction system of claim 20, comprising the plurality of ride vehicles and the retro-reflective markers associated with the plurality of ride vehicles, wherein the retro-reflective markers are positioned around a perimeter of a boundary region of each ride vehicle, and wherein the controller is configured to monitor changes in the light retro-reflected by the retro-reflective markers to identify whether a rider has crossed into one of the boundary regions.~~

~~32. The amusement park attraction system of claim 31, wherein the controller is configured to cause the plurality of ride vehicles to stop in response to determining that the rider has crossed into one of the boundary regions.~~

~~33. The amusement park attraction system of claim 32, wherein the controller is configured to detect a wearable retro-reflective marker on a wristband worn by the rider to determine whether the rider crossed the boundary region or if the change in reflected light from the retro-reflective markers in the boundary region was due to an anomaly.~~

~~34. The amusement park attraction system of claim 31, wherein the controller is configured to cause a control panel associated with the plurality of ride vehicles to provide a visual and/or audible alarm in response to determining that the rider has crossed into one of the boundary regions.~~

~~35. A method comprising:~~

~~emitting light toward retro-reflective markers positioned on a plurality of ride vehicles using one or more emitters, the plurality of ride vehicles being positioned on a ride path, wherein the retro-reflective markers are configured to retro-reflect the emitted light;~~

monitoring retro-reflected light from the retro-reflective markers using one or more detectors located relative to the ride path such that the one or more detectors are able to receive the retro-reflected light from the retro-reflective markers of the plurality of ride vehicles;

determining ridership, rider movement, or ride readiness of the plurality of ride vehicles based on identification of which of the retro-reflective markers of the plurality of ride vehicles are retro-reflecting light using a controller communicatively coupled to the one or more detectors; and

adjusting an operational parameter of the plurality of ride vehicles based on the determined ridership, rider movement, or ride readiness using the controller.

36. The method of claim 35, wherein determining ridership, rider movement, or ride readiness of the plurality of ride vehicles comprises determining whether a seat of the plurality of ride vehicles is occupied or determining a degree of movement of a respective rider within the seat by monitoring retro-reflection by a respective retro-reflective marker positioned on the seat.

37. The method of claim 36, wherein determining whether the seat is occupied or determining the degree of movement of the respective rider within the seat comprises identifying changes in a pattern of retro-reflected light produced by an array of retro-reflective markers positioned on the seat.

38. A system, comprising:

a tracking system configured to monitor a parameter of each ride vehicle of a plurality of ride vehicles based at least on identification and tracking of retro-reflective markers positioned on each ride vehicle of the plurality of ride vehicles, wherein the tracking system comprises:

a controller configured to monitor retro-reflected light from the retro-reflective markers positioned on each ride vehicle of the plurality of ride vehicles to determine

~~ridership, rider movement, or ride readiness of each ride vehicle of the plurality of ride vehicles based on identification of which of the retro-reflective markers of each ride vehicle of the plurality of ride vehicles are retro-reflecting light, and wherein the controller is configured to adjust an operational parameter of the plurality of ride vehicles based on the determined ridership, rider movement, or ride readiness.~~

~~39. The system of claim 38, wherein the controller is configured to identify changes in a pattern of retro-reflected light produced by an array of retro-reflective markers positioned on a seat of each ride vehicle of the plurality of ride vehicles, and to correlate the changes in the pattern to a degree of rider movement within the seat, to occupancy of the seat, or to proper securement of a rider in the seat.~~