CLAIMS

1. An outdoor lighting system, comprising:

a plurality of street lights;

a luminaire associate coupled to at least some of the street lights and comprising a plurality of luminaire associate components including: a signal processor, a communications device, a radiation transmitter/receiver, and a plurality of mechanical devices associated with the mounting and control of the plurality of street lights;

at least one gimbal attached to the luminaire associate, the gimbal having a motorized system being operative for controlling the position of the plurality of luminaire associate components and thereby directing the radiation transmitter/receiver for the luminaire associate in a direction of at least one target area on a roadway, wherein the at least one target area is determined using inputs from a plurality of sensors; and

a controller operatively coupled to the motorized system of the luminaire associate to control movement of the gimbal;

wherein the signal processor analyzes radiation received by the transmitter/receiver from the at least one target area.

2. The system of claim 1 wherein radiation is transmitted towards the target area from one of the luminaire associates and reflected radiation energy is received by another of the luminaire associate to determine if there is water, ice or snow on the target area.

3. The system of claim 1 further comprising at least one search pattern that the controller operates for the gimbal.

4. The system of claim 1 further comprising at least one security device or security measure, wherein the security device or the security measure is selected from: monitoring a predetermined perimeter delineated by the street lighting system; or authenticating; encrypting communications; or authenticating commands and messages throughout the system.

5. The system of claim 1, wherein the plurality of sensors comprises an image sensor, wherein the image sensor is rotatable by the gimbal.

6. The system of claim 5, wherein the plurality of sensors comprises an acoustic sensor and wherein the signal processor runs an algorithm that analyzes sounds in the vicinity of the street light to provide a location of the target area and controls the gimbal to rotate the image sensor towards the location.

7. The system of claim 1 wherein results of analysis of received radiation by the processor are sent by the communication device to a traffic condition database at a remote location.

8. The system of claim 1 wherein the remote location interfaces with the plurality of street lights and provides control and monitoring of the street lights, and wherein the results are used to adjust operation of the street lights.

9. The system of claim 8 wherein the luminaire associate contain a GPS receiver allowing the system to have knowledge of the locations of the street lights and the target area.

10. The system of claim 9 further comprising a search pattern stored within the luminaire associate that controls the gimbal to rotate the transmitter/receiver to view a sequence of the target areas.

11. A method for detecting situations on a roadway comprising:

determining a target area on the roadway using inputs from a plurality of sensors;

controlling movement of at least one gimbal contained within at least a portion of a plurality of street lights, the portion having a radiation transmitter/receiver that moves with the gimbal towards the target area;

transmitting radiation from the radiation transmitter/receiver towards the target area; receiving radiation reflected from the target area by at least one of the transmitter/receivers; and

signal processing of received radiation by a computational device within the street light containing the at least one of the transmitter/receivers.

12. The method of claim 11 wherein the signal processing is performed by an algorithm run by the computational device that analyzes received radiation to determine if water, ice or snow is present on the target area.

13. The method of claim 11 wherein receiving further comprises receiving images via an image sensor within the street light to acquire images of the target area.

14. The method of claim 11 further comprising communicating results of signal processing to a traffic condition database at a remote location using a communications device within the street light.

15. The method of claim 14 wherein controlling further comprises controlling the plurality of street lights from the remote location that interfaces with the communications device for the street light.

16. The method of claim 15 wherein controlling further comprises running a search pattern using the gimbals to rotate the transmitter/receiver to view a sequence of the target areas.

17. The method of claim 11 further comprising accessing locations of the street lights and the target area using a GPS receiver within at least one of the street lights.

18. The method of claim 11 wherein controlling further comprises controlling the gimbal in response to sounds received from an acoustic sensor in at least one of the street lights.

19. The method of claim 18 further comprising signal processing sounds received by the acoustic sensor to determine if water, ice or snow is present on the target area.

20. The method of claim 19 further comprising communicating signal processing results to a traffic condition database at the control and monitoring station.