CLAIMS

1. An auxiliary lighting system for a helmet operable in conjunction with a vehicle lighting system comprising a battery and a vehicle brake light, the auxiliary lighting system comprising:

(a) a helmet portion comprising:

a helmet electrical power supply;

a helmet lighting unit connected to the power supply and comprising at least a helmet brake light;

a helmet microcontroller connected to the helmet electrical power supply and in signal communication with the helmet brake light; and

a helmet transceiver in signal communication with the helmet microcontroller; and

(b) a vehicle portion comprising:

a vehicle transceiver in wireless signal communication with the helmet transceiver; and

a first gate in communication with the vehicle transceiver, and under a condition when an electrical signal is received from the vehicle transceiver, operable to electrically connect the battery to the vehicle brake light; and

(c) an accelerometer in signal communication with the helmet microcontroller, and operable to send a signal indicative of vehicle acceleration to the helmet microcontroller;

in which the helmet microcontroller is programmed with an algorithm such that when executed, when a level of deceleration of the vehicle greater than or equal to a predetermined threshold level of deceleration is sensed by the accelerometer, the helmet microcontroller receives a signal from the accelerometer indicative of the threshold level of deceleration being met or exceeded, and executes an algorithm, to send a signal to the helmet transceiver, and on to the vehicle transceiver, and on to the first gate, to electrically connect the battery to the vehicle brake light, and cause the vehicle brake light to be illuminated.

2. An auxiliary lighting system according to Claim 1, in which when the threshold level of deceleration is exceeded, the helmet microcontroller causes the helmet brake light to be illuminated.

3. An auxiliary lighting system according to Claim 1, in which the vehicle portion of the auxiliary lighting system is comprised of a supplemental vehicle brake light and a second gate, and in which when the threshold level of deceleration is met or exceeded, the helmet microcontroller sends a signal to the helmet transceiver, and on to the vehicle transceiver, and on to the second gate, operating to electrically connect the battery to the supplemental vehicle brake light, and cause the supplemental vehicle brake light to be illuminated.

4. An auxiliary lighting system for a helmet operable in conjunction with a vehicle lighting system comprising a battery, a vehicle lighting processor in electrical communication with a brake application sensor and with a vehicle brake light, the vehicle lighting processor configured to execute a power algorithm to supply electrical power through a conductor connected to the vehicle brake light and cause illumination of the vehicle brake light when a signal is received by the vehicle lighting processor from the brake application sensor indicative of an application of a vehicle brake, and a fault algorithm to detect absence or presence of a brake fault in the electrical communication with the vehicle brake light, the safety lighting system comprising:

(a) a helmet portion comprising:

a helmet electrical power supply;

a helmet lighting unit connected to the power supply and comprising at least a helmet brake light;

a helmet microcontroller connected to the power supply and in signal communication with the helmet brake light; and

a helmet transceiver in signal communication with the helmet microcontroller; and

(b) a vehicle portion comprising:

a vehicle transceiver in wireless signal communication with the helmet transceiver; and

a first gate in communication with the vehicle transceiver, and connected to the electrical conductor supplying electrical power to the vehicle brake light;

in which an electrical signal indicative of illumination of the vehicle brake light is communicable through the first gate to the vehicle transceiver while maintaining absence of the brake fault in the electrical communication with the vehicle brake light, and on to the helmet transceiver, and to the helmet microcontroller, and in which the helmet microcontroller is programmed with an algorithm to cause the helmet brake light of the auxiliary lighting system to be illuminated when the electrical signal indicative of illumination of the vehicle brake light is communicated.

5. An auxiliary lighting system according to Claim 4, in which the vehicle lighting system is further comprised of a vehicle left directional light and a vehicle right directional light, and the auxiliary lighting system is further comprised of:

a helmet left directional light in the helmet portion and in signal communication with the helmet microcontroller;

a helmet right directional light in the helmet portion and in signal communication with the helmet microcontroller;

a second gate in communication with the vehicle transceiver, and connected to an electrical conductor supplying electrical power to the vehicle left directional light, in which an electrical signal indicative of illumination of the vehicle left directional light is communicable through the second gate to the vehicle transceiver while maintaining absence of a left directional light fault in electrical communication of the vehicle lighting processor with the vehicle left directional light, and on to the helmet transceiver, and to the helmet microcontroller, and in which the helmet microcontroller is programmed with an algorithm to cause the helmet left directional light to be illuminated when the electrical signal indicative of illumination of the vehicle left directional light is communicated; and

a third gate in communication with the vehicle transceiver, and connected to an electrical conductor supplying electrical power to the vehicle right directional light, in which an electrical signal indicative of illumination of the vehicle right directional light is communicable through the third gate to the vehicle transceiver while maintaining absence of a right directional light fault in electrical communication of the vehicle lighting processor with the vehicle right directional light, and on to the helmet transceiver, and to the helmet microcontroller, and in which the helmet microcontroller is programmed with an algorithm to cause the helmet right directional light to be

illuminated when the electrical signal indicative of illumination of the vehicle right directional light is communicated.

6. An auxiliary lighting system according to Claim 4, further comprising an accelerometer in signal communication with the vehicle transceiver, and operable to send a signal indicative of vehicle acceleration to the vehicle transceiver.

7. An auxiliary lighting system according to Claim 6, in which the helmet microcontroller is programmed with an algorithm such that when executed, when a level of deceleration of the vehicle greater than or equal to a predetermined threshold level of deceleration is sensed by the accelerometer, the helmet microcontroller receives a signal from the accelerometer indicative of the threshold level of deceleration being met or exceeded, and executes an algorithm, to send a signal to the helmet transceiver, and on to the vehicle transceiver, and on to the first gate, to electrically connect the battery to the vehicle brake light, and cause the vehicle brake light to be illuminated.

8. An auxiliary lighting system according to Claim 7, in which the accelerometer is included in the vehicle portion of the auxiliary lighting system, and in which the signal indicative of vehicle acceleration from the accelerometer is communicable to the vehicle transceiver, to the helmet transceiver, and to the helmet microcontroller.

9. An auxiliary lighting system according to Claim 7, in which the vehicle portion of the auxiliary lighting system is further comprised of a supplemental vehicle brake light and a second gate, and in which when the threshold level of deceleration is exceeded, the helmet microcontroller sends a signal to the helmet transceiver, and on to the vehicle transceiver, and on to the second gate, operating to electrically connect the battery to the supplemental vehicle brake light, and cause the supplemental vehicle brake light to be illuminated.

10. An auxiliary lighting system for a helmet operable in conjunction with a vehicle lighting system comprising a battery, a vehicle brake light, and a vehicle lighting processor in electrical communication with a brake application sensor and with the vehicle brake light, the vehicle lighting processor configured to simultaneously provide electrical power and an encoded vehicle braking signal indicative of application of the vehicle brake to the vehicle brake light when the signal is received by the vehicle lighting processor from the brake application sensor indicative of an application of the vehicle brake, and the vehicle brake light is operable to detect the encoded vehicle braking signal and cause illumination of the vehicle

brake light when the encoded vehicle braking signal is present, the auxiliary lighting system comprising:

(a) a helmet portion comprising:

a helmet electrical power supply;

a helmet lighting unit connected to the power supply and comprising at least a helmet brake light;

a helmet microcontroller connected to the power supply and in signal communication with the helmet brake light; and

a helmet transceiver in signal communication with the helmet microcontroller; and

(b) a vehicle portion comprising:

a vehicle transceiver in wireless signal communication with the helmet transceiver; and

a first gate in signal communication with the vehicle transceiver and in signal communication with the vehicle lighting processor, and operable to pass the encoded vehicle braking signal to the vehicle transceiver, on to the helmet transceiver, and on to the helmet microcontroller when the vehicle lighting processor communicates the encoded vehicle braking signal to the first gate;

in which the helmet microcontroller is programmed with an algorithm such that when executed, when the encoded vehicle braking signal is received by the helmet microcontroller, the helmet microcontroller causes the helmet brake light to be illuminated.

11. An auxiliary lighting system according to Claim 10, in which:

the vehicle lighting system is further comprised of a vehicle left directional light and a vehicle right directional light, and the vehicle lighting processor is programmed with an algorithm to simultaneously provide electrical power and an encoded left turn signal to the vehicle left directional light when a left turn signal is received by the vehicle lighting processor from a left turn signal sensor, and the left directional light is operable to detect the encoded left turn signal and cause illumination of the left directional light when the encoded left turn signal is present, and to simultaneously provide electrical power and an encoded right turn signal to the vehicle right directional light when a right turn signal

is received by the vehicle lighting processor from a right turn signal sensor, and the right directional light is operable to detect the encoded right turn signal and cause illumination of the right directional light when the encoded right turn signal is present;

the helmet lighting system is further comprised of a helmet left directional light, and a helmet right directional light; and

the helmet microcontroller is programmed with an algorithm such that when executed, when the encoded left turn signal is received by the helmet microcontroller, the helmet microcontroller causes the helmet left directional light to be illuminated, and when the encoded right turn signal is received by the helmet microcontroller, the helmet microcontroller causes the helmet right directional light to be illuminated.

12. An auxiliary lighting system according to Claim 10, further comprising an accelerometer in signal communication with the helmet microcontroller, and operable to send a signal indicative of vehicle acceleration to the helmet microcontroller, in which the helmet microcontroller is programmed with an algorithm such that when executed, when a level of deceleration of the vehicle greater than or equal to a predetermined threshold level of deceleration is sensed by the accelerometer, the helmet microcontroller receives a signal from the accelerometer indicative of the threshold level of deceleration being met or exceeded, and causes the helmet brake light to be illuminated.

13. An auxiliary lighting system according to Claim 12, further comprising a second gate in signal communication with the vehicle transceiver and in signal communication with the vehicle lighting processor and the vehicle brake light, and operable to pass encoded signals to the vehicle lighting processor, in which the helmet microcontroller is programmed with an algorithm such that when executed, when the accelerometer communicates to the helmet microcontroller that the level of deceleration of the vehicle is greater than or equal to the predetermined threshold level of deceleration, the helmet microcontroller communicates the encoded vehicle braking signal to the helmet transceiver, to the vehicle transceiver, to the third gate, and to the processor and vehicle brake light, causing the vehicle brake light to be illuminated.

14. An auxiliary lighting system according to Claim 12, in which the accelerometer is included in the vehicle portion of the auxiliary lighting system and is in communication with the vehicle transceiver, and in which a signal indicative of vehicle acceleration from the

accelerometer is communicable to the vehicle transceiver, to the helmet transceiver, and to the helmet microcontroller.

15. An auxiliary lighting system according to Claim 12, in which the accelerometer is contained in the helmet.

16. An auxiliary lighting system according to Claim 10, in which:

the vehicle portion of the auxiliary lighting system is comprised of a second gate and a supplemental brake light;

the auxiliary lighting system is further comprised of an accelerometer in signal communication with the helmet microcontroller and operable to send a signal indicative of vehicle acceleration to the helmet microcontroller, and

the helmet microcontroller is programmed with an algorithm such that when executed, when a level of deceleration of the vehicle greater than or equal to a predetermined threshold level of deceleration is sensed by the accelerometer, the helmet microcontroller receives a signal from the accelerometer indicative of the threshold level of deceleration being met or exceeded, and sends a signal to the helmet transceiver, and on to the vehicle transceiver, and on to the second gate, to electrically connect the battery to the supplemental brake light, and cause the supplemental brake light to be illuminated.

17. An auxiliary lighting system according to Claim 16, in which the accelerometer is included in the vehicle portion of the auxiliary lighting system and is in communication with the vehicle transceiver, and in which the signal indicative of vehicle acceleration from the accelerometer is communicable to the vehicle transceiver, to the helmet transceiver, and to the helmet microcontroller.

18. An auxiliary lighting system according to Claim 4, in which the vehicle lighting processor of the vehicle lighting system is configured to simultaneously provide electrical power and an encoded vehicle braking signal indicative of application of the vehicle brake to the vehicle brake light when the signal is received by the vehicle lighting processor from the brake application sensor indicative of an application of the vehicle brake, and the vehicle brake light is operable to detect the encoded vehicle braking signal and cause illumination of the vehicle brake light when the encoded vehicle braking signal is present, and in which the

encoded vehicle braking signal indicative of illumination of the vehicle brake light is communicable through the first gate to the vehicle transceiver while maintaining the absence of the brake fault in the electrical communication with the vehicle brake light, and on to the helmet transceiver, and to the helmet microcontroller, and in which the helmet microcontroller is programmed with an algorithm to cause the helmet brake light of the auxiliary lighting system to be illuminated.

19. An auxiliary lighting system according to Claim 6, in which the helmet microcontroller is programmed with an algorithm such that when executed, when a level of deceleration of the vehicle greater than or equal to a predetermined threshold level of deceleration is sensed by the accelerometer, the helmet microcontroller receives a signal from the accelerometer indicative of the threshold level of deceleration being met or exceeded, and executes an algorithm, causing the helmet brake light to be illuminated.

20. An auxiliary lighting system according to Claim 10, in which the vehicle lighting processor is configured to execute a fault algorithm to detect absence or presence of a brake fault in the electrical communication with the vehicle brake light, and in which the encoded vehicle braking signal indicative of illumination of the vehicle brake light is communicable through the first gate to the vehicle transceiver while maintaining absence of the brake fault in the electrical communication with the vehicle brake light.