CLAIMS

What is claimed is:

1. A method of processing traffic signal priority requests, comprising:

receiving at an intersection, a traffic signal priority request from a vehicle;

determining a number of stopped vehicles at the intersection and on an approach to the intersection in response to receiving the priority request;

computing an activation threshold as a function of an estimated-time-of-arrival (ETA) threshold and the number of stopped vehicles;

wherein the computing the activation threshold includes adding an amount of time to the activation threshold for each vehicle of the number of stopped vehicles, and the times added to the activation threshold for the number of stopped vehicles are not be the same for all of the number of stopped vehicles;

determining a vehicle ETA of the vehicle at the intersection in response to the priority request;

submitting, in response to the vehicle ETA being less than the activation threshold, the priority request for preemption service processing at the intersection; and

bypassing, in response to the vehicle ETA being greater than the activation threshold, submission of the priority request for preemption service processing at the intersection.

2. The method of claim 1, wherein the computing of the activation threshold includes adding a quantity of time to the activation threshold for each vehicle determined to be stopped on the approach at the intersection.

3. The method of claim 1, wherein the determining the number of stopped vehicles includes determining the number of vehicles that are in one lane on the approach.

4. The method of claim 1, wherein the determining the number of stopped vehicles includes:

determining numbers of stopped vehicles in a plurality of lanes on the approach, respectively; and

selecting a greatest one of the respective numbers as the number of stopped vehicles at the intersection.

5. The method of claim 1, further comprising:

determining whether or not the vehicle is on any approach to the intersection in response to receiving the priority request; and

in response to determining that the vehicle is not on any approach to the intersection, bypassing the determining the number of stopped vehicles and the computing of the activation threshold and vehicle ETA.

6. The method of any of claims 1-5, wherein the determining the number of stopped vehicles includes determining the number of stopped vehicles from signals from inductive loops on the approach at the intersection.

7. The method of any of claims 1-5, wherein the determining the number of stopped vehicles includes determining the number of stopped vehicles from digital images of the approach at the intersection.

8. The method of any of claims 1-5, wherein the determining the number of stopped vehicles includes determining the numbers of stopped vehicles from Dedicated Short Range Communications (DSRC) Basic Safety Messages transmitted from the stopped vehicles at the intersection.

9. A system for processing traffic signal priority requests, comprising:

a priority request receiver configured and arranged to the receive priority requests:

a data collector configures and arranged to provide data indicative of vehicles at an intersection;

a processor coupled to the priority request receiver and to the data collector;

a memory coupled to the processor, wherein the memory is configured with instructions that when executed by the processor cause the processor to:

receive at the intersection, a traffic signal priority request of the traffic signal priority requests from a vehicle;

determine a number of stopped vehicles at the intersection and on an approach to the intersection in response to receiving the priority request and using the data indicative of vehicles at an intersection;

compute an activation threshold as a function of an estimated-time-of-arrival (ETA) threshold and the number of stopped vehicles;

wherein the instructions that compute the activation threshold include instructions that add an amount of time to the activation threshold for each vehicle of the number of stopped vehicles, and the times added to the activation threshold for the number of stopped vehicles are not be the same for all of the number of stopped vehicles;

determine a vehicle ETA of the vehicle at the intersection in response to the priority request;

submit, in response to the vehicle ETA being less than the activation threshold, the priority request for preemption service processing at the intersection; and

bypass, in response to the vehicle ETA being greater than the activation threshold, submission of the priority request for preemption service processing at the intersection.

10. The system of claim 9, wherein the data collector is configured to capture digital images.

11. The system of claim 9, wherein the data collector is configured to capture signals from inductive loops.

12. The system of claim 9, wherein the data collector is configured to input messages indicating geographical locations of the vehicles.

CLAIMS

What is claimed is:

1. A method of processing traffic signal priority requests, comprising:

receiving at an intersection, a traffic signal priority request from a vehicle;

determining a number of stopped vehicles at the intersection and on an approach to the intersection in response to receiving the priority request;

computing an activation threshold as a function of an estimated-time-of-arrival (ETA) threshold and the number of stopped vehicles;

determining a vehicle ETA of the vehicle at the intersection in response to the priority request;

submitting, in response to the vehicle ETA being less than the activation threshold, the priority request for preemption service processing at the intersection; and

bypassing, in response to the vehicle ETA being greater than the activation threshold, submission of the priority request for preemption service processing at the intersection.

2. The method of claim 1, wherein the computing of the activation threshold includes adding a quantity of time to the activation threshold for each vehicle determined to be stopped on the approach at the intersection.

3. The method of claim 1, wherein the determining the number of stopped vehicles includes determining the number of vehicles that are in one lane on the approach.

4. The method of claim 1, wherein the determining the number of stopped vehicles includes:

determining numbers of stopped vehicles in a plurality of lanes on the approach, respectively; and

selecting a greatest one of the respective numbers as the number of stopped vehicles at the intersection.

5. The method of claim 1, wherein the determining the number of stopped vehicles includes determining the number of stopped vehicles from signals from inductive loops on the approach at the intersection.

6. The method of claim 5, wherein the computing of the activation threshold includes adding a quantity of time to the activation threshold for each vehicle determined to be stopped on the approach at the intersection.

7. The method of claim 5, wherein the determining the number of stopped vehicles includes determining the number of vehicles that are in one lane on the approach.

8. The method of claim 5, wherein the determining the number of stopped vehicles includes:

determining numbers of stopped vehicles in a plurality of lanes on the approach, respectively; and

selecting a greatest one of the respective numbers as the number of stopped vehicles at the intersection.

9. The method of claim 5, further comprising:

determining whether or not the vehicle is on any approach to the intersection in response to receiving the priority request; and

in response to determining that the vehicle is not on any approach to the intersection, bypassing the determining the number of stopped vehicles and the computing of the activation threshold and vehicle ETA.

10. The method of claim 1, wherein the determining the number of stopped vehicles includes determining the number of stopped vehicles from digital images of the approach at the intersection.

11. The method of claim 10, wherein the computing of the activation threshold includes adding a quantity of time to the activation threshold for each vehicle determined to be stopped on the approach at the intersection.

12. The method of claim 10, wherein the determining the number of stopped vehicles includes determining the number of vehicles that are in one lane on the approach.

13. The method of claim 10, wherein the determining the number of stopped vehicles includes:

determining numbers of stopped vehicles in a plurality of lanes on the approach, respectively; and

selecting a greatest one of the respective numbers as the number of stopped vehicles at the intersection.

14. The method of claim 10, further comprising:

determining whether or not the vehicle is on any approach to the intersection in response to receiving the priority request; and

in response to determining that the vehicle is not on any approach to the intersection, bypassing the determining the number of stopped vehicles and the computing of the activation threshold and vehicle ETA.

15. The method of claim 1, further comprising:

determining whether or not the vehicle is on any approach to the intersection in response to receiving the priority request; and

in response to determining that the vehicle is not on any approach to the intersection, bypassing the determining the number of stopped vehicles and the computing of the activation threshold and vehicle ETA.

16. The method of claim 1, wherein the determining the number of stopped vehicles includes determining the number of stopped vehicles from Dedicated Short Range

Communications (DSRC) Basic Safety Messages transmitted from the stopped vehicles at the intersection.

17. A system for processing traffic signal priority requests, comprising:

a priority request receiver configured and arranged to receive the priority requests;

a data collector configured and arranged to provide data indicative of vehicles at an intersection;

a processor coupled to the priority request receiver and to the data collector;

a memory coupled to the processor, wherein the memory is configured with instructions that when executed by the processor cause the processor to:

receive at the intersection, a traffic signal priority request of the traffic signal priority requests from a vehicle;

determine a number of stopped vehicles at the intersection and on an approach to the intersection in response to receiving the priority request and using the data indicative of vehicles at an intersection;

compute an activation threshold as a function of an estimated-time-of-arrival (ETA) threshold and the number of stopped vehicles;

determine a vehicle ETA of the vehicle at the intersection in response to the priority request;

submit, in response to the vehicle ETA being less than the activation threshold, the priority request for preemption service processing at the intersection; and

bypass, in response to the vehicle ETA being greater than the activation threshold, submission of the priority request for preemption service processing at the intersection.

18. The system of claim 17, wherein the data collector is configured to capture digital images.

19. The system of claim 17, wherein the data collector is configured to capture signals from inductive loops.

20. The system of claim 17, wherein the data collector is configured to input messages indicating geographical locations of the vehicles.