CLAIMS

1. A method of managing transit vehicle schedules, comprising:

determining a current location and current heading of a transit vehicle by a global positioning system (GPS) module aboard the transit vehicle and communicating the current location and current heading to a computer processor;

determining a current time and current day by the computer processor;

selecting one trip schedule from a plurality of trip schedules in a database by the computer processor, the one trip schedule having attributes consistent with the current location, current heading, current time, and current day;

determining whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule; and

outputting a signal that indicates whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule;

wherein each trip schedule of the plurality of trip schedules specifies a starting location having an associated heading, an associated start time, and an associated day, and each trip schedule further specifies a plurality of stop locations and associated stop times, and the selecting the trip schedule includes:

determining that none of the plurality of trip schedules in the database has a starting location that matches the current location; and

in response to the determining that none of the plurality of trip schedules in the database has a starting location that matches the current location, selecting from the plurality of trip schedules in the database, the one trip schedule that specifies a stop location that matches the current location and a starting location having an associated start time that is later than the current time and earlier than the start times later than the current time and associated with other trip schedules of the plurality of trip schedules;

determining a difference between the current time and the start time associated with the starting location of the one trip schedule; and

adjusting stop times associated with the stop locations of the one trip schedule by the difference.

2. The method of claim 1, wherein:

the selecting includes determining that the starting location of the one trip schedule matches the current location, the starting location of the one trip schedule has an associated heading that matches the current heading, an associated day of the one trip schedule matches the current day, and an associated start time of the one trip schedule matches the current time; and

the determining whether the transit vehicle is ahead of or behind the one trip schedule includes:

periodically updating the current time, location, and heading;

determining a next stop location;

determining an estimated time of arrival (ETA) at the next stop location;

determining that the transit vehicle is ahead of the one trip schedule in response to the ETA being earlier than the stop time associated with the next stop location; and

determining that the transit vehicle is behind the one trip schedule in response to the ETA being later than the stop time associated with the next stop location.

3. The method of claim 1, further comprising:

enabling a priority request device to make traffic signal priority (TSP) requests in response to the signal indicating the transit vehicle is behind the one trip schedule; and

disabling the priority request device from making TSP requests in response to the signal indicating the transit vehicle is ahead of the one trip schedule.

4. A system for managing transit vehicle schedules, comprising:

a priority request device configured to be mounted to a transit vehicle and including:

a memory;

a global positioning system (GPS) module;

a computer processor coupled to the memory and to the GPS module;

wherein the memory is configured to store a plurality of trip schedules and instructions that when executed by the computer processor cause the computer processor to:

determine a current time, a current day, a current location, and a current heading of the transit vehicle from the GPS module;

select one trip schedule from the plurality of trip schedules, the one trip schedule having attributes consistent with the current time, the current day, the current location, and the current heading of the transit vehicle;

determine whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule; and

output a signal that indicates whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule;

wherein each trip schedule of the plurality of trip schedules specifies a starting location having an associated heading, an associated start time, and an associated day, and each trip schedule further specifies a plurality of stop locations and associated stop times, and the instructions that select the trip schedule include instructions that:

determine that none of the plurality of trip schedules has a starting location that matches the current location; and

select, in response to the determining that none of the plurality of trip schedules has a starting location that matches the current location, from the plurality of trip schedules, the one trip schedule that specifies a stop location that matches the current location and a starting location having an associated start time that is later than the current time and earlier than the start times later than the current time and associated with other trip schedules of the plurality of trip schedules;

determine a difference between the current time and the start time associated with the starting location of the one trip schedule; and

adjust stop times associated with the stop locations of the trip schedule by the difference.

5. The system of claim 4, wherein:

the instructions that select include instructions that determine that the starting location of the one trip schedule matches the current location, the starting location of the one trip schedule has an associated heading that matches the current heading,

an associated day of the one trip schedule matches the current day, and an associated start time of the one trip schedule matches the current time; and

the instructions that determine whether the transit vehicle is ahead of or behind the one trip schedule include instructions that:

periodically update the current time, location, and heading;

determine a next stop location;

determine an estimated time of arrival (ETA) at the next stop location;

determine that the transit vehicle is ahead of the one trip schedule in response to the ETA being earlier than the stop time associated with the next stop location; and

determine that the transit vehicle is behind the one trip schedule in response to the ETA being later than the stop time associated with the next stop location.

6. The system of claim 4, wherein the memory is further configured with instructions that when executed by the computer processor cause the computer processor to:

enable making traffic signal priority (TSP) requests in response to the signal indicating the transit vehicle is behind the one trip schedule; and

disable making TSP requests in response to the signal indicating the transit vehicle is ahead of the one trip schedule.

7. A system for managing transit vehicle schedules, comprising:

a priority request device configured to be mounted to a transit vehicle and configured to:

determine a current time, a current day, a current location and a current heading of the transit vehicle; and

transmit data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

a transit-stop module configured for placement at a transit stop and configured to:

store a plurality of trip schedules;

receive the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

select one trip schedule from the plurality of trip schedules, the one trip schedule having attributes consistent with the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle; and

transmit the one trip schedule to the priority request device;

wherein the priority request device is further configured to:

determine whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule; and

output a signal that indicates whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule;

wherein each trip schedule of the plurality of trip schedules specifies a starting location having an associated heading, an associated start time, and an associated day, and each trip schedule further specifies a plurality of stop locations and associated stop times, and the transit-stop module configured is further configured to:

determine that none of the plurality of trip schedules has a starting location that matches the current location; and

select, in response to the determining that none of the plurality of trip schedules has a starting location that matches the current location, from the plurality of trip schedules, the one trip schedule that specifies a stop location that matches the current location and a starting location having an associated start time that is later than the current time and earlier than the start times later than the current time and associated with other trip schedules of the plurality of trip schedules;

determine a difference between the current time and the start time associated with the starting location of the one trip schedule; and

adjust stop times associated with the stop locations of the trip schedule by the difference.

8. A system for managing transit vehicle schedules, comprising:

a priority request device configured to be mounted to a transit vehicle and configured to:

determine a current time, a current day, a current location and a current heading of the transit vehicle; and

transmit data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

a transit-stop module configured for placement at a transit stop and configured to:

receive the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle from the priority request device; and

transmit the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

a server coupled to the transit-stop module and configured to:

store a plurality of trip schedules;

receive the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle from the transit-stop module;

select one trip schedule from the plurality of trip schedules, the one trip schedule having attributes consistent with the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle; and

transmit the one trip schedule to the transit-stop module;

wherein the transit-stop module is further configured to:

receive the one trip schedule from the server; and

transmit the one trip schedule to the priority request device;

wherein the priority request device is further configured to:

determine whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule; and

output a signal that indicates whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule;

wherein each trip schedule of the plurality of trip schedules specifies a starting location having an associated heading, an associated start time, and an associated day, and each trip schedule further specifies a plurality of stop locations and associated stop times, and the server is further configured to:

determine that none of the plurality of trip schedules has a starting location that matches the current location; and

select, in response to the determining that none of the plurality of trip schedules has a starting location that matches the current location, from the plurality of trip schedules, the one trip schedule that specifies a stop location that matches the current location and a starting location having an associated start time that is later than the current time and earlier than the start times later than the current time and associated with other trip schedules of the plurality of trip schedules;

determine a difference between the current time and the start time associated with the starting location of the one trip schedule; and

adjust stop times associated with the stop locations of the trip schedule by the difference.

9. A system for managing transit vehicle schedules, comprising:

a priority request device configured to be mounted to a transit vehicle and configured to:

determine a current time, a current day, a current location and a current heading of the transit vehicle; and

transmit data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

a server communicatively coupled to the priority request device and configured to:

store a plurality of trip schedules;

receive the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle;

select one trip schedule from the plurality of trip schedules, the one trip schedule having attributes consistent with the data specifying the current time, the current day, the current location, and the current heading of the transit vehicle; and

transmit the one trip schedule to the priority request device;

wherein the priority request device is further configured to:

determine whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule; and

output a signal that indicates whether the transit vehicle is ahead of the one trip schedule or behind the one trip schedule;

wherein each trip schedule of the plurality of trip schedules specifies a starting location having an associated heading, an associated start time, and an associated day, and each trip schedule further specifies a plurality of stop locations and associated stop times, and the server is further configured to:

determine that none of the plurality of trip schedules has a starting location that matches the current location; and

select, in response to the determining that none of the plurality of trip schedules has a starting location that matches the current location, from the plurality of trip schedules, the one trip schedule that specifies a stop location that matches the current location and a starting location having an associated start time that is later than the current time and earlier than the start times later than the current time and associated with other trip schedules of the plurality of trip schedules;

determine a difference between the current time and the start time associated with the starting location of the one trip schedule; and

adjust stop times associated with the stop locations of the trip schedule by the difference.