Working Document Traffic Simulator

Problem Specification:

The project requires to develop a way to simulate traffic in a city in a top-down fashion. 3 different types of vehicles needs to be simulated: Cars, Buses and Motorcycles. The program will be needing to take inputs from the user, as well as having the ability to display the objects inside the stimulation to the user.

Decomposition:

Based on the problem specification, objects can be created to stimulate the different vehicles and the road. These objects will interact with one another to stimulate traffic to satisfy the problem specification. The Objects needed will be a Car class, Bus class, Motorbike class, Traffic Light class, Road class and the Main, which will be containing the stimulation.

Car:

This class will represent a car. The attributes in this class are:

* ID: identifier for each different car
* Length: The length of the car in which it occupies in the roads
* Breadth: The width of the car in which it occupies in the road. This will be half of the cars length
* Speed: How fast the car can move
* Position: Where is the car located on the road
* Current Road: The road the car is travelling on.

Bus:

This class will be a subclass of car. It will inherit attributes from the Car class, but length will be 3 times the length of a Car.

Motorbike:  
This class will be another subclass of car. It will inherit attributes from car, but the length will be half the length of a Car

Road:

This class will be an object which will describe the elements of a road following the Australian road rules. The attributes in road class are:

* ID: identifier for each different road
* Length: Length of the road
* Start location: XY coordinates of where the road begins
* End Location: XY coordinates of where the road ends
* Connected roads: All of the roads which are connected to this road
* Lights on the road: Traffic lights that are on this road
* Cars on the road: vehicles that are currently on this road

Traffic Light:  
This class will represent a traffic light that can be in a state of green or red. The attributes in the Traffic Light class are:

* ID: identifier for each different traffic light
* State: if the traffic light is green or red
* Position: Location of the traffic light on a road
* Road attached to: Which road the light is attached to