***Working Document***

The client needs a traffic simulator; a way to simulate real life city road/car traffic. The program will be tailored to meet these needs, through the use of console, where it would allow user input, notably in creating the setting for the simulation itself. However, this version of the program is only able to simulate a single car moving along a straight road with a single traffic light.

This problem can be separated into class objects for the program and simulation that interact with each other and the input, including:

Car

The Car class object defines the average road vehicle. Could be a normal car, a bus, a motorcycle, a truck, or the like (will be implemented as subclasses later).

Contains the following attributes:

+ id (public string): *the car class object’s own unique identifier*

+ speed (public integer): *the car’s travel speed relative to the simulation*

+ position (public integer): *where the car is, relative to the road*

+ road (public road): *the road that the car is on*

The car will be able to move along the road at the road’s speed limit through the use of the move() method, interacting with whatever is in the path (such as traffic lights and, later, other cars. By interaction, this mostly means the car may stop moving in response to a red light or, similarly, another car that is stationary)

Road

The Road class object defines a single lane of road

Contains the following attributes:

+ id (public string): *the road class object’s own unique identifier*

+ length (public integer): *the amount of “road” there is for the lane*

+ speed\_limit (public integer): *the maximum speed cars are to have obligated by law. Also the denoting factor for what the car’s speed will be.*

For this version of the program, the speed limit is set to 1, such that cars will move incrementally with each “tick” of the simulation

TrafficLight

The TrafficLight class object defines the simple red/green (no yellow) traffic light

Contains the following attributes:

+ id (public string): *the TrafficLight class object’s own unique identifier*

+ state (public boolean): *whether the light is green (1, True, on) or red (0, False, off)*

+ position (public integer) : *where the traffic light is, relative to the road*

+ road (public road): *the road that the traffic light is on*

The traffic light periodically changes from red to green and vice versa through the use of the light() method

Main

The program will also have a/the Main() class, which is where the whole simulation takes place, including implementations of the class objects