MARMARA UNIVERSITY

FACULTY OF ENGINEERING
COMPUTER SCIENCE & ENGINEERING
DEPARTMENT

IE3081
MODELING AND DISCRETE SIMULATION
Homework #1

A. Tunahan Cinsoy - 150117062

Highway Booth Simulation

Entities

- Vehicle
- Booth

Attributes

- Vehicle: A vehicle may be a car, truck or a bus. These vehicles will pass booth in order to continue their routes. So, their main attribute is being movable objects. Also, they may have barcode on their plates in order to make payment at "Fast Passing System" booths.
- Booth: Booths will have different attributes named as "Fast Passing System" and "Cash/Credit Card Payment System".

Activities

- Duration that has passed during the payment process at booth is main activity of our simulation.

Events

- In our simulation, the main event is the arrival of the vehicles to the booth. Then, their departure from the booth.
- In addition, transition from busy to available or available to busy is also an event for our booths.

State Variables

- The state variables for our vehicles are "moving" and "stopped at booth".
- For booths, state variables are "busy" and "available".

Relations between System Component

- We can separate the explanation of this part into two groups, for "Fast Passing System" and for "Cash Payment System". The duration of payment process will be 10 seconds and 30 seconds and also average waiting time at queue (if exists), respectively.

$$Total\ Waiting\ Time = Waiting\ Time\ at\ Queue + Service\ Time$$