Analysis of system constraints:

Please refer to the highlevel\_system\_revision\_1.pdf for references.

Let Step 1: Start to arrival of video to computer

Let Step 2: End of step 1 to single image extraction to produce a uniform scale image of vehicle with ID and type.

Let Step 3: End of step 2 to license plate extraction to extract vehicle object with license plate number

Let Step 4: End of step 3 to End of the whole process.

Analysis:

Step 1 will take only a constant latency (the latency of the network) which is insignificant and is not considered in subsequent analysis.

Step 2 will take time:

t = nt0, where t0 = 1/fps of video.

n = number of frames during which an object remains in the field of view of the camera.

We have,

t = texit – tentry

Let s be the speed limit of the road and d be the actual distance that is captured in the field of view of the camera.

Then, we have the minimum time an object remains in view:

tmin = d/s.

In order to pipeline the execution, we have:

tmax(step n) = tmin(step n-1)

Thus, for step 3, we the maximum available processing time with guaranteed complete coverage of all the vehicles in the road is:

tmax(3) = d/s.

Step 4 shall have a similar constraint but since it is a simple OLTP operation, it is guaranteed to complete within its time frame.

Thus, we have the following pipelined schedule:

Step 2

Step 3

Step 4

t

t

t

t

t

t

t