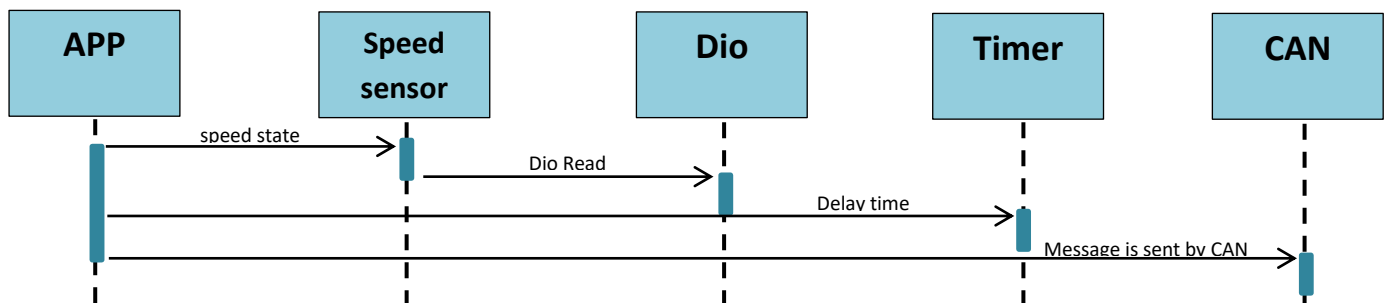
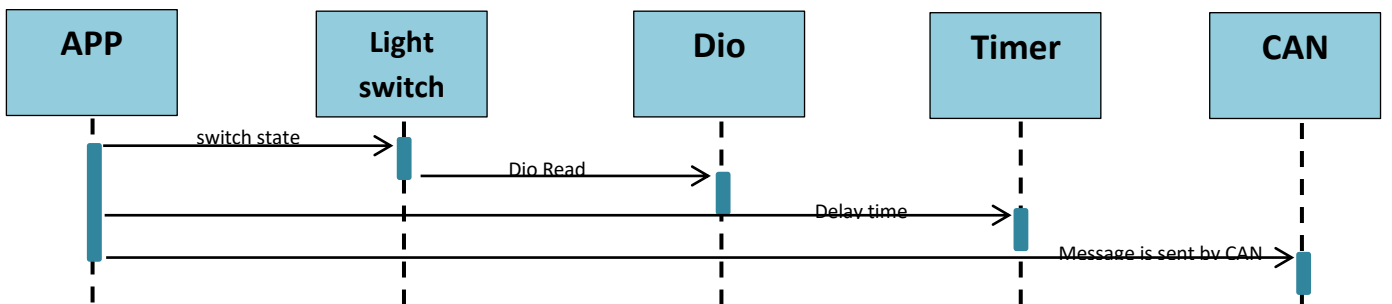
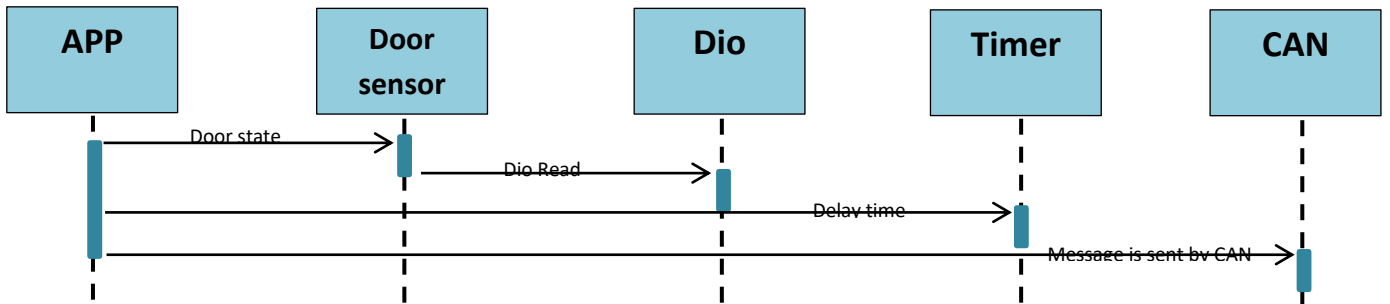


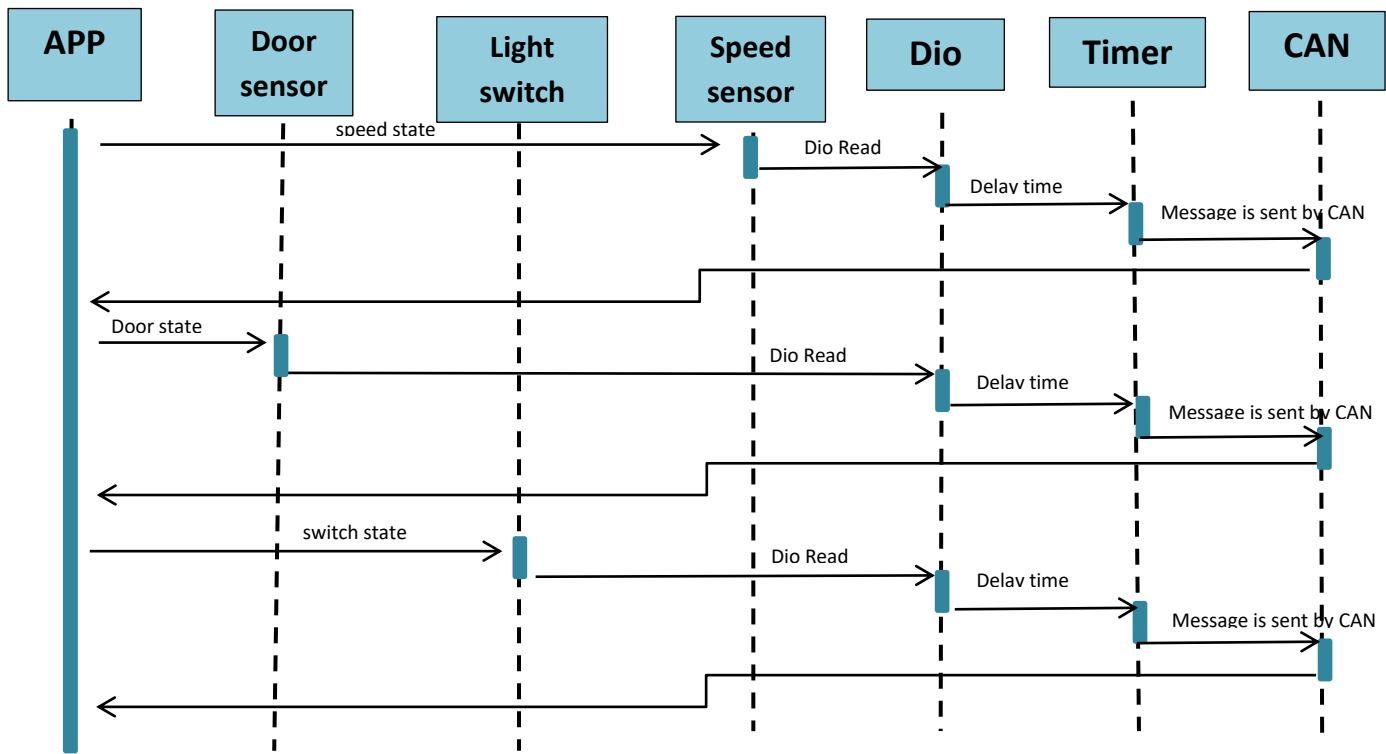
## Dynamic design analysis

For ECU 1:

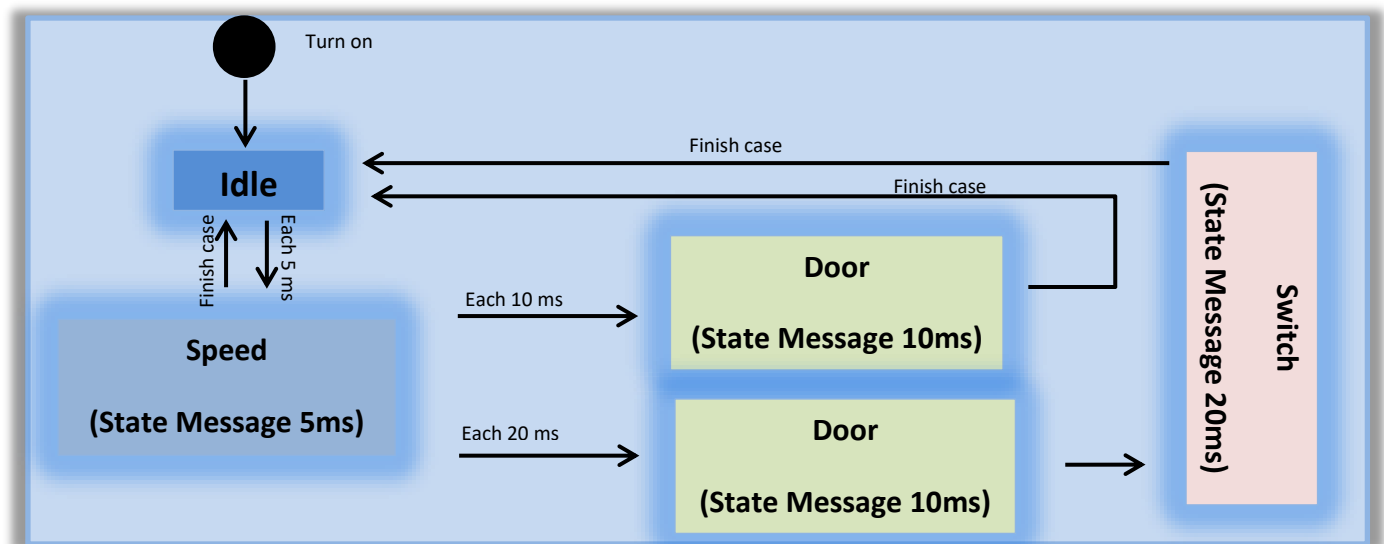
- Draw a state machine diagram for each ECU component



- Draw a state machine diagram for the ECU operation
- Assume 20ms now



- Draw the sequence diagram for the ECU



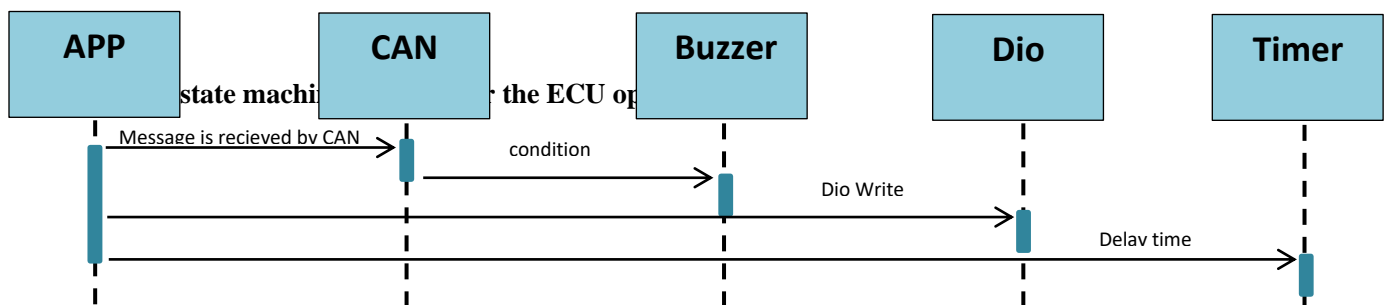
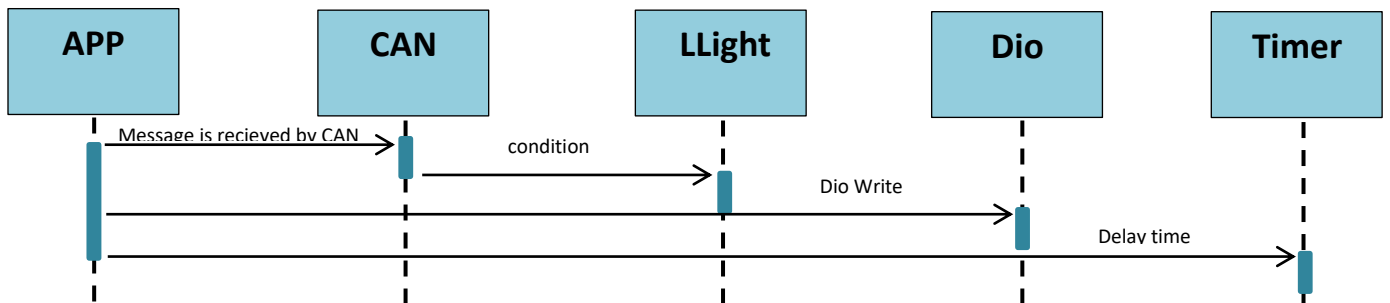
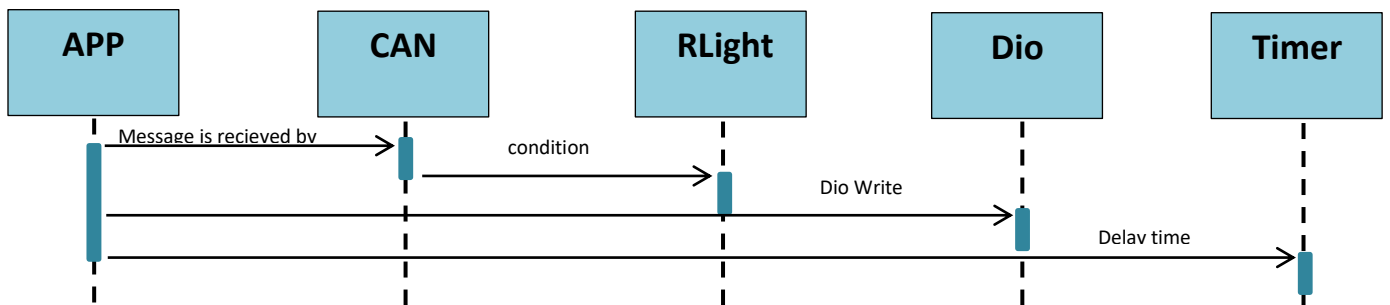
➤ Calculate CPU load for the ECU

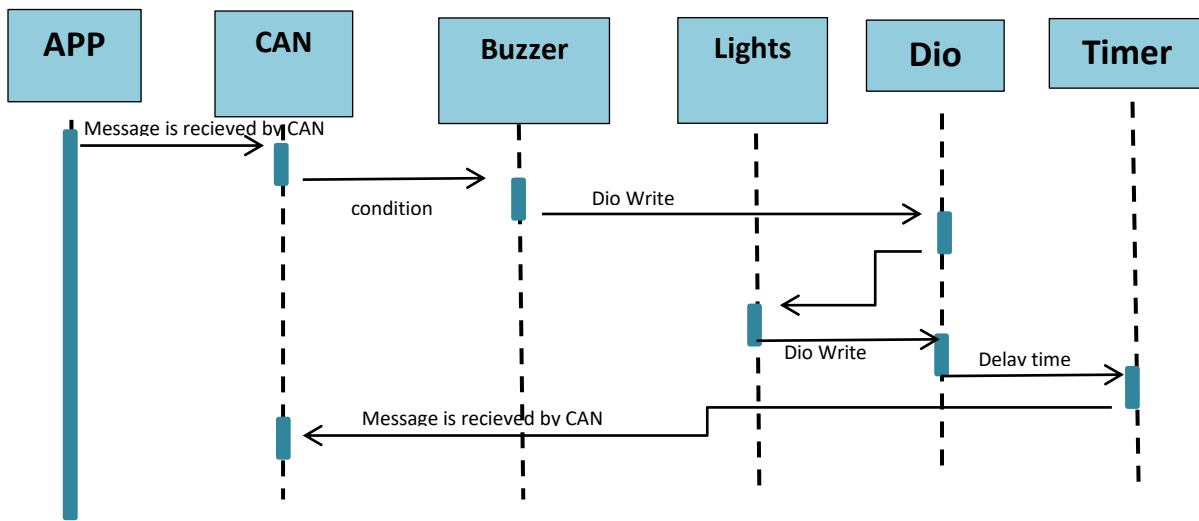
- Hyperperiod = 20 ms
- The CPU Load
- CPU load = Total Execution Time During Hyperperiod / Hyperperiod ▪ For One Hyperperiod
  - Speed\_Sensor = 4\*30.47 us
  - Limit\_Switch = 1\*57.6 us
  - Door Sensor = 2\*35.47 us

➤ CPU Load =  $((0.03047 * 4) + (0.03547 * 2) + (0.0576 * 1)) / 20 = .25042 = 25.042\%$

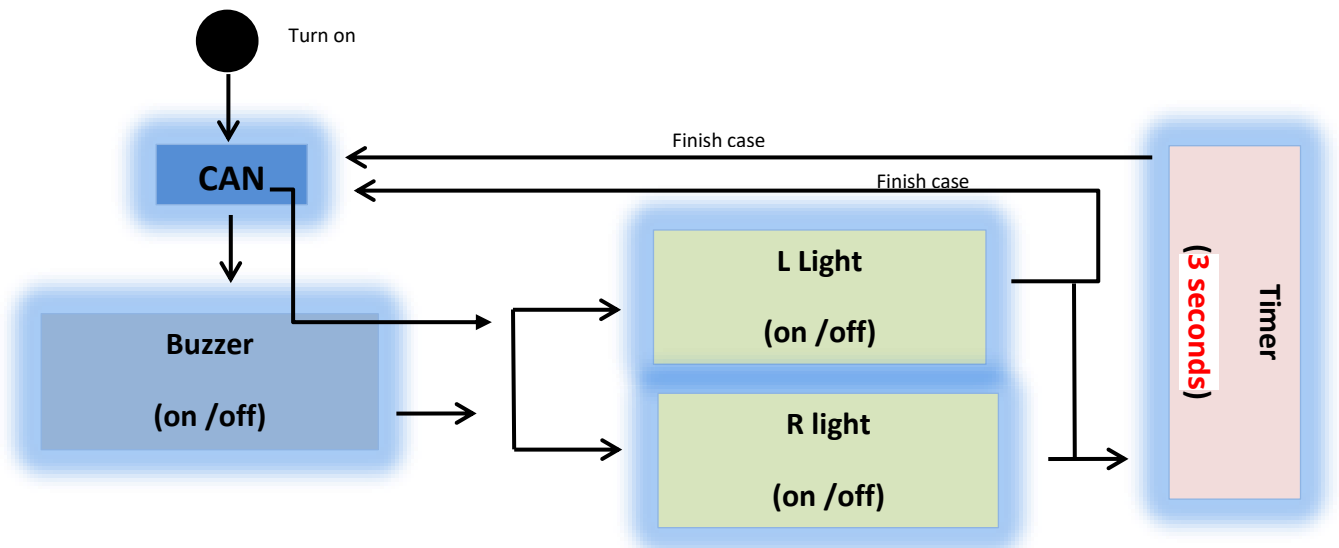
For ECU 2:

- Draw a state machine diagram for each ECU component





➤ Draw the sequence diagram for the ECU



➤ Calculate CPU load for the ECU

- Hyperperiod = 20 ms
- The CPU Load
- CPU load = Total Execution Time During Hyperperiod / Hyperperiod ▪ For One Hyperperiod
  - main = 1000 \* 10 us

➤ CPU Load =  $(1000 * .010) / 20 = .50 = 50\%$