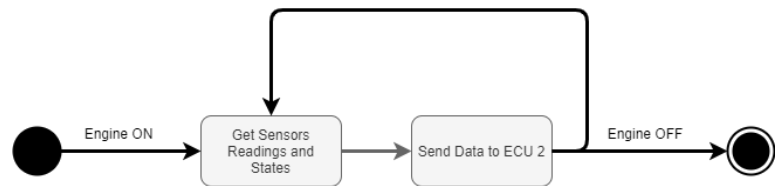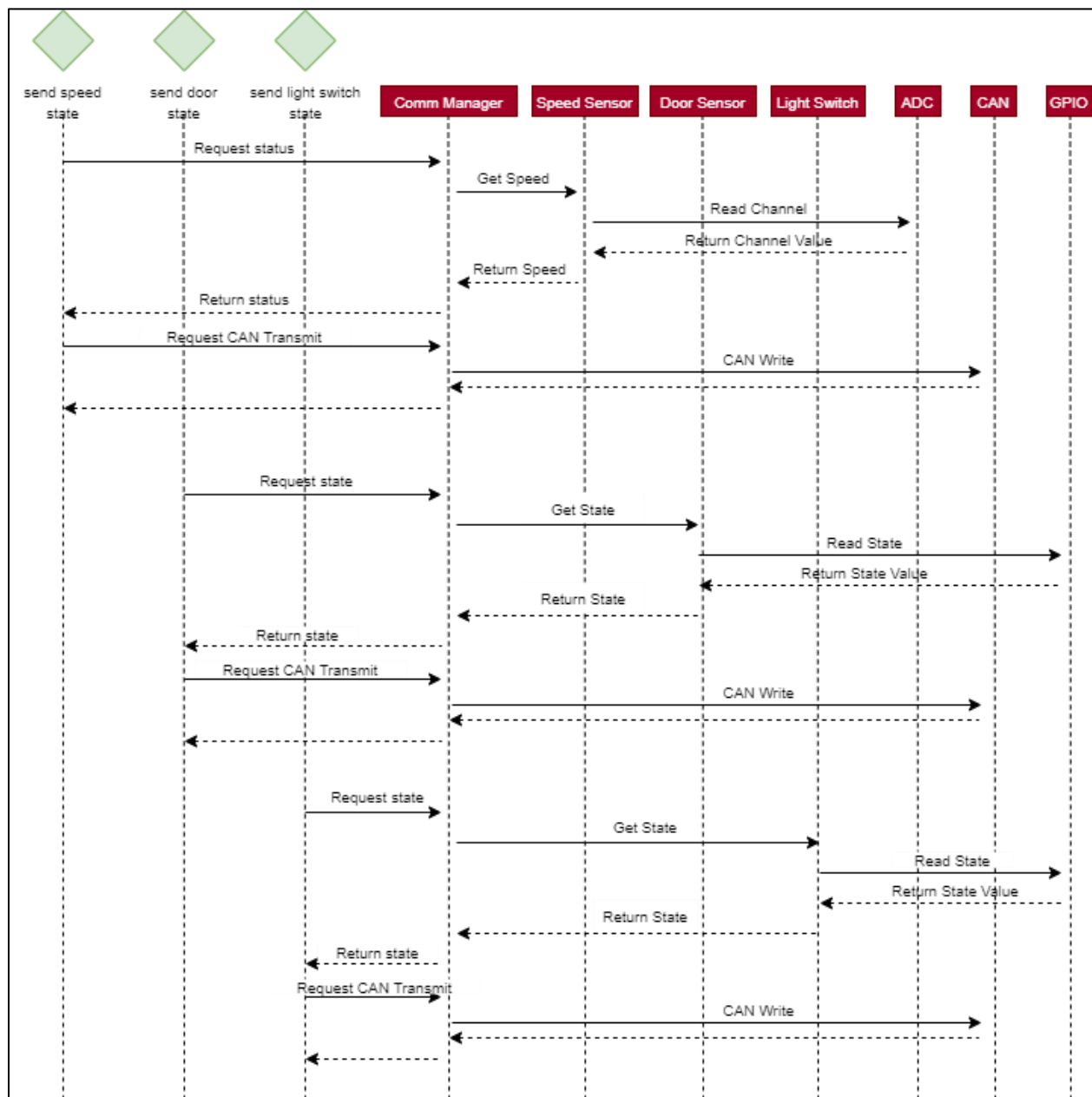# Dynamic Design

ECU1: State Machine

ECU1: Sequence Diagram

ECU1: CPU Load

Assumption 1: one task to read 3 sensor states, periodicity 5ms.
Assumption 2: execution time for each task is 1ms.
Read task: P: 5, D: 5, E: 1
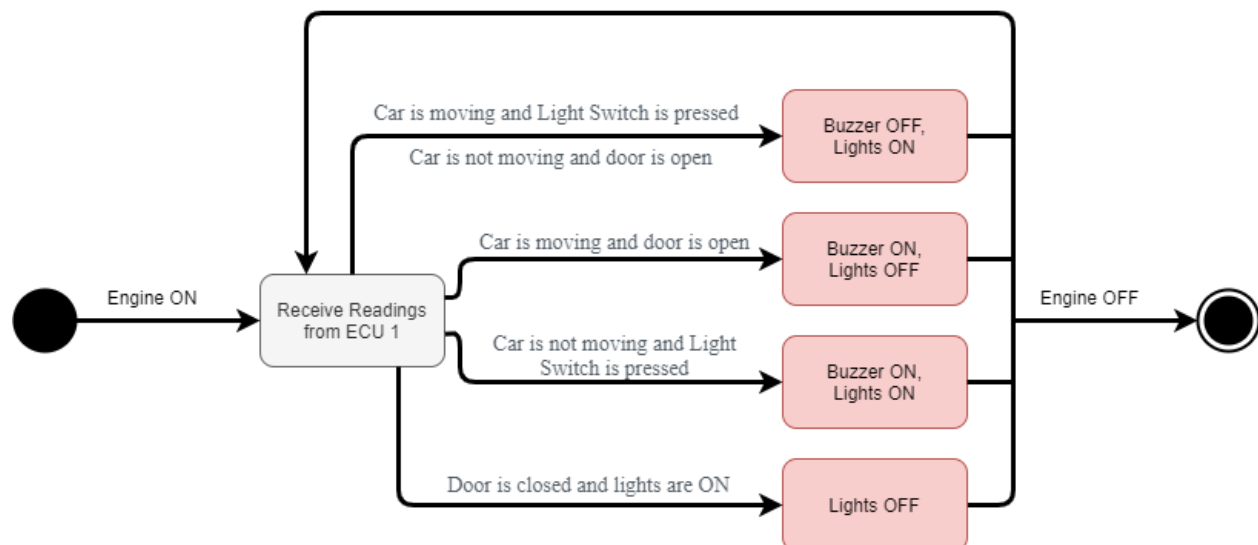Send speed state task: P: 5, D: 5, E: 1
Send door state task: P: 10, D: 10, E: 1
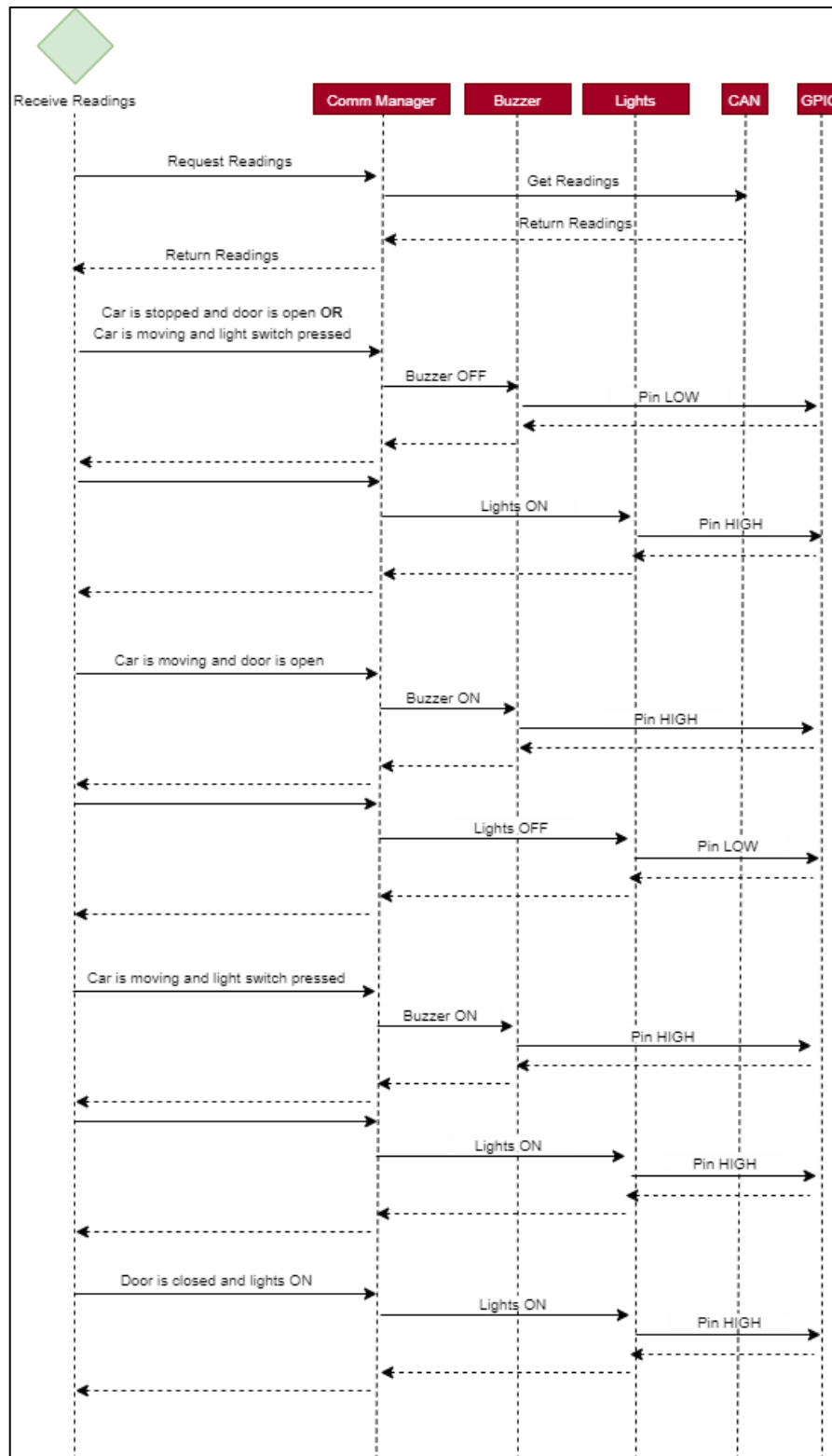Send LSW state task: P: 20, D: 20, E: 1
CPU load: $1/5 + 1/5 + 1/10 + 1/20 = 0.55$ → ⬚ 55%

ECU2: State Machine

ECU2: Sequence Diagram

ECU2: CPU Load

Assumption 1: we have one action task for the decision, periodicity is 20ms..
Assumption 2: execution time for each task is 1ms
Read speed state task: P: 5, D: 5, E: 1
Read door state task: P: 10, D: 10, E: 1
Read LSW state task: P: 20, D: 20, E: 1
Action task: P: 20, D: 20, E: 1
CPU load: $1/5 + 1/10 + 1/20 + 1/20 = 0.40$ → 40%

Bus Load/sec

Total time for data/sec = $1000/5 + 1000/10 + 1000/20 = 350ms$

Bus load = 35%