

Testing and Refinement

4 Test Cases

Test case 1. Train on approach, no vehicle

Train on track. True

Vehicle on track. False

Expected output. Gates lowered

Output. Gates lowered

Reasoning. A train is on approach so the gate is to close regardless of vehicular presence

Test case 2. Train on approach, vehicle on crossing

Train on track. True

Vehicle on track. True

Expected output. Gates lowered

Output. Gates lowered

Reasoning. A train is on approach, the gate must lower to prioritise the vehicle and rail traffic safety.

Test case 3. No train, Vehicle on crossing

Train on track. False

Vehicle on track. True

Expected output. Gates lowered

Output. Gates lowered

Reasoning. The gates are lowered, trapping the vehicle on the track.

Test case 4. No train, No vehicle on crossing

Train on track. False

Vehicle on track. False

Expected output. Gates raised

Output. Gates raised

Reasoning. No train and a clear crossing gives the go ahead for the gate to be raised.

Improvements

The circuit logic has a major flaw. When a vehicle is on the track, the gate lowers meaning that if a train is on approach, the gate will lower, trapping the vehicle on the track. My refinement would instead see the gate to remain raised when a train is on approach momentarily until the vehicle on the track has cleared away, ensuring no vehicles are trapped on the track.