Step 3 – Evaluation of Alternatives

Both alternatives achieve safety, but they differ in complexity and reliability.

- Simplicity: The rule-based system is easiest to implement and explain.
- Safety: The state-machine system provides stronger guarantees because it clearly defines behaviour in every state, including faults.
- Reliability: State-machine designs scale better when more sensors or conditions are added.

Overall, Alternative B offers better handling of more complex cases and is more reliable, but Alternative A is quicker and simpler for small systems.

Step 4 – justified Decision

I chose Alternative B , State-Machine Logic. While it is slightly more complex to design leading to higher costs, it provides clear states, robust handling of sensor errors, and ensures fail-safe behaviour to best protect the people using the railway crossing whether that's the trains, vehicles or pedestrians.This makes the solution more reliable and suitable for a real-world railway environment. Although the assignment states that it should be cost effective, I believe the cost of something that is controlling life or death for users should not put cost ahead of human lives.