**Traffic Light Scenario**

Now let’s put your newfound knowledge to use by solving a hypothetical problem. As the town planner for a rural shire, you have a problem with a single-lane bridge that crosses the river. Every week, one or two accidents occur at night, when tired drivers rush across the bridge without first stopping to see if the road is clear. You have suggested that traffic lights be installed, but the mayor wants to see them demonstrated before signing off on the purchase. You could rent temporary lights, but they’re expensive. Instead, you’ve decided to build a model of the bridge with working traffic lights using LEDs and an Arduino.

**The Goal**

Our goal is to install three-color traffic lights at each end of the single-lane bridge. The lights allow traffic to flow only in one direction at a time. When sensors located at either end of the bridge detect a car waiting at a red light, the lights will change and allow the traffic to flow in the opposite direction.

**The Algorithm**

We’ll use two buttons to simulate the vehicle sensors at each end of the bridge. Each set of lights will have red, yellow, and green LEDs. Initially, the system will allow traffic to flow from west to east, so the west-facing lights will be set to green and the east-facing lights will be set to red. When a vehicle approaches the bridge (modeled by pressing the button) and the light is red, the system will turn the light on the opposite side from green to yellow to red, and then wait a set period of time to allow any vehicles already on the bridge to finish crossing. Next, the yellow light on the waiting vehicle’s side will blink as a “get ready” notice for the driver, and finally the light will change to green. The light will remain green until a vehicle approaches the other side, at which point the process repeats.